

ANNUAL STATISTICAL AND OPERATING REPORT
JANUARY 5, 1946

Railway Age

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RAILWAY AGE

The Railways in Transition

After twelve years of depression (1930-1941, inclusive) and almost four years of war (1942-1945, inclusive) the people and industries of America face a future fraught with great potentialities and great dangers.

One vitally important fact usually disregarded by those who now engage in economic forecasting is that since the beginning of the Great Depression the population of the United States has increased about 18 million—from 122 million to almost 140 million. This equals the increase in the twelve years 1917 to 1929—including our nineteen months' participation in World War I and the subsequent decade of post-war readjustment and prosperity. Increase of population and increase of production per capita are the most important influences that determine a nation's economic progress.

This country's national income increased from \$46 billion in 1917 to \$79 billion in 1929; national income per capita, from \$454 to \$654. An equal increase in income *per capita* in 1946 over 1929 would make it \$120 billion in 1946—50 per cent more than in 1929 and one-third more than in 1941.

Huge Increase in Potential Market

The post-war national income, *measured in money*, will be determined by *prices* and by the volume of goods and services produced. Whatever the future national income *measured in money* may be, the important fact is, that during the past sixteen years of depression and war there has occurred this large increase in population.

The increase in population is so important for three principal reasons. First, it shows that the potential domestic market for all goods and services would be much larger now than sixteen years ago if there had been neither depression nor war. Second, the expansion of the potential domestic market has been much greater in proportion since 1929 than the increase in population because the increase in population has occurred during sixteen years throughout which production for civilian purposes has been abnormally restricted, in the first place, by the depression and, later, by the war.

Third, the increase of 18 million in total population has included an increase of about 9 million in the num-

ber of persons available for engaging in the production of goods and services.

A Nation Bursting Out at the Seams

Because of the increase of population, and of the enormous accumulation of unsatisfied needs during the depression and the war, the nation, as we enter the New Year, is bursting out at the seams. Owing to the most extreme shortage of housing in history—shortages of houses, of apartments, of hotels—due to lack of building for a decade and a half, millions are without homes and many thousands can hardly find lodging on necessary business trips. Local public transportation almost everywhere is inadequate and abominable. At a time when the railways are struggling desperately to handle huge movements of home-coming troops, inter-city transportation by highway can afford them little relief because of the decline in the number and deterioration of the condition of motor vehicles. There are shortages of everything—shirts, washing machines, candy, paper, printing capacity, furniture, whatever you desire, whether for personal or business purposes.

And confronting these shortages, there are huge amounts of purchasing power accumulated during the war in the hands of both the consuming public and of business. Consequently, never in the history of this or any other nation did there exist at any time economic conditions more favorable to a prolonged period of high level construction, production, transportation, employment and prosperity than now exist in the United States.

Sound Economic Adjustments Essential

But even a large and growing population having such great and pressing needs, and abundance of the purchasing power, man-power and capital required for satisfying those needs, are not sufficient to cause high level production, employment and prosperity. For the attainment of these objectives, it is essential that all parts of the economic system shall be adjusted to each other—that the payrolls and profits of each industry, and the prices and rates of all the many industries producing goods and services, shall be brought into and kept in balance by free and unsubsidized competition,

or, in the cases of naturally monopolistic industries, by economically sound government regulation.

In this period of transition from a war to a peace economy, prospects that otherwise would be very bright are clouded by demands from labor unions, and actual and threatened government policies, which disregard the adjustments that must be made and the balances that must be established and maintained to enable private enterprise in production and transportation to function with full efficiency. But private enterprise and prosperity have been similarly threatened before. Private enterprise in this country is a hardy perennial. It is stubbornly resisting the unfavorable climate. Probably, as after World War I, we shall pass through readjustments as a result of which a generally higher than pre-war level of wages and prices will be established; and then go through a period of years of higher level production and employment than ever were attained before in peace-time.

Railway Difficulties in 1945

It is not difficult to appraise the performance of the railways during the two-thirds of last year when war continued and the one-third of it after war ended. The termination of the war with Germany in May presented them with new problems, and the termination of the war with Japan in August again presented them with new problems. The story of the ways in which they dealt with these problems is told in articles appearing elsewhere in this issue. The most difficult of them was the handling of millions of troops, especially after V-J day made it necessary to move troops simultaneously from both the Atlantic and Pacific coasts. The troops were unloaded on the railways much faster than any schedules made by the government anticipated. Civilian travel, in consequence, was disrupted. Freight traffic was declining; but even the handling of the declining freight traffic was seriously hindered by the diversion of many locomotives from freight service to troop train service, and by the unusually severe weather which extended across the entire northern part of the country in December.

As the year 1945 closed freight traffic had declined about 20 per cent and was still declining. Prospects of earnings in the early part of 1946 were poor. And, meantime, there was under way mediation of railway labor union demands for advances in wages and new "featherbed" rules the granting of even part of which would cause a huge increase in labor costs.

Facing the Future with Courage

Nevertheless, railway managements were facing the future with courage, if not with equal confidence. Outstanding orders at the end of 1945 for passenger-train cars of the most advanced types were the largest in many years; and there were large orders for locomotives. Orders for freight cars were still relatively small, but seemed sure to be greatly increased because of the need for extensive replacements. It is interesting in this connection to recall how large, after the depression in 1921-1922, were the installations and retirements of equipment (including equipment rebuilt) in the five post-war years 1923-1927, inclusive. Locomotive in-

stallations in these five years averaged 2,437 annually and retirements, 2,641; freight car installations, 138,844, and retirements, 132,199; passenger-train car installations, 13,272, and retirements, 12,471. Total purchases of equipment and materials in this five-year period averaged \$1,645 million annually, as compared with an average of only \$1,200 million in the four years 1941-1944, inclusive, during which equipment and fixed structures were subjected to much the most destructive use in history.

Record Traffic, If Sound Policies Prevail

In view of the uncertainties due to transition from peace to war, to labor disputes and to prevailing and threatened government policies, it would be hazardous to make either a short-term or a long-term forecast regarding the railways. But this paper believes there are good reasons for expecting them to do about as well in future as other major industries.

Production and construction will set new peace-time records if the purchasing power of the people and of business that already exists and that can be created is afforded opportunity and incentive to do the buying necessary to supplying the huge accumulation of national needs. In that case there will be an unprecedented peace-time traffic to divide among the different classes of carriers; and the preparations the railways are making to capture their share of it promise to be in large measure successful.

How much their costs will be reduced by repeal of the excess profits tax and increased by higher wages and prices is conjectural. But they already have a good case for advances in freight rates, which will be strengthened by whatever further increases occur in their costs.

While the prices of the products of other industries were increasing during the war, the rates of the railways remained virtually unchanged. The Interstate Commerce Commission granted them after the last war advances in rates needed because of changes in conditions similar to those with which the nation and the railroads are now confronted; and it can reasonably be expected to adjust rates again in accordance with changed economic and transportation conditions as it did then.

Railways' Prospects Are as Good as Those of Other Industries

The railways made a magnificent record of achievement during the war. The unique indispensability of good and adequate railway service to the national welfare was demonstrated as never before. The railways, in entering 1946, apparently have little or no more reason than any other large American industry for doubt regarding their future or for hesitating to plan for it upon the assumption that it will be a future of opportunity. If they do not do well in future, it will be because of socialistic government policies that will prevent all private enterprise from doing well; and there is evidence, including the recent attitude of Congress, that the tide of public sentiment is beginning to run strongly against socialistic policies and in favor of giving private enterprise the opportunity that the national welfare requires that it shall be given.

Capital Funds Outlook Continues Bright

Assets' excess over liabilities amounts to \$2 billion,
but is there enough statesmanship to hold it there?

AT the end of September, 1945, the excess of the railroads' current assets over their current liabilities totaled approximately \$2 billion—an improvement of more than \$350 million since the end of 1944; and an improvement of \$1.2 billion since the end of 1941. For eight straight years prior to 1940, this comparison of current assets with current liabilities was a minus quantity, i.e., the current liabilities exceeded the current assets. Details are given in Table I.

It is true, of course, that traffic and earnings have declined sharply since the war ended, and that earnings will be hard hit in the closing months of the year, not only by this traffic decline, but also by the rapid amortization of the

By J. G. LYNE
Assistant to Editor

It has been frequently observed—by leaders in the railroad industry and also in these pages—that, whatever the post-war prospects of the railroads may be, the industry should, at least, have the resources with which to initiate desirable improvements on a considerable scale. Whether such a program of improvements could long continue would, of course, depend upon the magnitude of post-war earnings and the degree of esteem in which the railroads were held

Transportation Statistics," issued by the I. C. C. Bureau of Transport Economics and Statistics on December 10, 1945.

In this statement is given an estimate of probable capital expenditures by the railroads in the three years following the end of the war. The estimate is based upon information furnished by the railroads to the I. C. C. bureau in April, 1945, and the reporting railroads made it clear that they did not intend to use their war-time accumulation of current assets to finance a program of improvements, but, rather, that they would look to earnings in the post-war years themselves to provide the cash or the loans to finance post-war improvements. Of the estimated capital outlays, the railroads expected to finance less than 8 per cent from their war-time earnings. Of total expenditures, the carriers foresaw that 62 per cent would be financed directly from post-war earnings and 30 per cent from post-war borrowings.

The railroads' current assets position continued to improve during 1945, up to the end of the war—but what the decline in earnings may do to it in the early part of 1946 is problematical. If this assets position can be maintained, it will afford the best possible augury for the maintenance of large capital expenditures and the consequent assurance of a vigorous and healthy railroad industry. On the other hand, depletion of these assets by wage increases or a continuance of rates on their sub-standard pre-war level, in a time of declining traffic, would quickly pull the pin on the train of progress.

Capital Outlays Estimated

Most of the railroads predicated their estimates on an arbitrary assumption that net railway operating income in the immediate post-war years would parallel that of approximately \$1 billion which they earned in 1941. With such earnings assumed, their estimate was that they would spend a total of something more than \$1.6 billion on capital improvements in the first three post-war years. "Press reports of orders placed in recent months," says the I. C. C. statement, "indicate that the expenditures of some railroads may exceed the

capital cost of expenditures made to provide facilities to accommodate war traffic. These projects were authorized to be amortized in five years, or during the war years, which means that many of them will be charged off in three years or even less. Such action will have a severe, but happily temporary, effect on the monthly earnings statements of the railroads; and, as far as net income is concerned, the effect of these charges will be considerably alleviated by reason of the mitigation they will effect in excess profits taxes.

Excess Profits Tax Repeal

The ending of the excess profits tax with 1945 will also provide a considerable offset to the decline in revenues occasioned by the termination of the war. In 1944 the railroads paid more than \$1 billion in excess profits taxes, compared to less than \$300 million in other federal income taxes. It is evident, therefore, that relief from this impost will be of tangible benefit; although it is impossible to estimate with any assurance what the degree of help from this source will amount to.

by investors during that period. There now appears evidence worthy of serious attention to indicate that the railroads believe that it is their post-war earnings, and not their war-time accumulation of quick assets, which will be looked to as the determinant of post-war capital expenditures. This evidence appears in the "Monthly Comment on

Table I—Selected Balance Sheet Items, Class I Line-Haul Railways

Year	Cash and Temporary Cash Investments (000)	Total Current Assets (000)	Total Current Liabilities (000)	Excess of Current Assets over Current Liabilities (000)	Total Long- Term Debt (000)	Total Corporate Surplus (000)
1929*	\$677,955	\$1,717,953	\$1,200,984	\$516,969	\$11,138,121	\$5,029,171
1930*	592,071	1,510,975	1,162,170	348,805	11,174,816	4,577,730
1931	419,510	1,213,350	1,147,239	66,111	11,153,678	4,395,508
1932	379,136	1,063,271	1,130,731	- 67,460	11,247,777	4,094,531
1933	394,117	1,034,560	1,261,382	- 226,822	11,112,055	3,900,883
1934	380,212	1,058,326	1,471,321	- 412,995	11,041,472	3,714,302
1935	439,403	1,086,467	1,670,767	- 584,300	10,821,788	3,507,220
1936	578,343	1,292,421	1,885,574	- 593,153	10,452,266	3,349,889
1937	392,486	1,143,990	1,937,830	- 793,840	10,686,814	3,126,391
1938	480,550	1,120,968	2,243,961	-1,122,993	10,558,723	2,739,742
1939	578,359	1,292,705	2,555,903	-1,263,198	10,352,646	2,563,879
1940	680,400	1,442,142	697,200†	744,942	11,288,311†	2,474,249
1941	904,600	1,914,544	1,115,320‡	799,224	11,186,063	2,666,625
1942	1,736,933	3,065,093	1,806,030	1,259,063	10,879,476	3,167,986
1943	2,807,275	4,497,065	2,923,078	1,573,987	10,462,770	3,748,508
1944	2,753,560	4,488,042	2,844,210	1,643,832	9,830,186	4,327,893
1945	2,895,926	4,565,795	2,559,578	2,006,217	(1945 totals are Sept. 30)	

* Switching & Terminal Companies Included.

† In 1940 and thereafter long-term debt in default is included in long-term debt. In years prior thereto it is included in current liabilities. Likewise in 1940 and thereafter default interest is removed from current liabilities to deferred liabilities.

‡ Tax liability included in 1941 and thereafter.

three-year totals shown in their returns." No one is likely to accuse the commission of extravagance in that observation.

Will Assets Be Conserved?

It is certainly of great importance, however, to those who are looking to substantial capital expenditures by the railroads—alike to sustain employment and to assure the continuance of improving transportation—to interest themselves in the political circumstances which will so largely determine post-war earnings and expenditures. These political circumstances, of course, include the policies which will be followed regarding wage increases which railway unions are demanding; the attitude of shippers and regulatory authorities toward rate increases to offset increased operating costs; and the degree, if any, to which politics may be persuaded to desist in its profligate donations of public funds for the development of highway, waterway and air transportation—with utter disregard of the effect of such largesse on privately-financed transportation.

Whether current assets as they stand in 1946 will be decreased to make a direct contribution to capital outlays or whether such assets will merely fortify the railroads in their willingness to expend further earnings more liberally than they would otherwise be inclined to do, these assets certainly cannot be frittered away in wage increases or by the continuance of an improvident level of rates without seriously endangering future railroad employment and the provision of adequate and improving service. Those who are interested in the preservation of a vigorous and advancing railroad industry will do well, therefore, to observe the attitude of shippers, unions, and the regulatory and political authorities during the current year toward this accumulation of railroad assets. A great deal will depend upon whether they regard it as a treasure trove to be raided or a reasonable reserve to assure the post-war vigor of the railroad industry.

Foresighted opinion among railroad managements insists that the railroads' assets position is not any stronger than ordinary prudence requires it to be. For

one thing, those who hold this view point out that the current assets of the railroads include \$606 million in the item of material and supplies. Unlike the inventory of a manufacturing enterprise, the railroads' stocks of materials and supplies are not liquid assets which will be quickly turned into cash after being processed. On the contrary, they represent an amount of working capital tied up in supplies needed for the current level of operations.

The costs of doing business have substantially increased since 1940, and the railroads must keep on hand, not only a larger reserve of supplies, but also of cash to meet increased payrolls, material bills, and other expenses. Furthermore, during the war the railroads have been unable to maintain their properties as they should have because of shortages in both man-power and materials. Accurate accounting would have required the railroads to have set up definite reserves, charged to operating expenses, to compensate for these deficiencies—but the Treasury would not permit such charges. Nevertheless, these deficiencies will have to be taken up and funds will be needed

Table II—Increase in Cash and Current Assets of Individual Large Railroads

	Cash & Temporary Cash Investments Sept. 30		Inc. or Dec. %	Total Current Assets		Total Current Liabilities		Excess of Current Assets over Liabilities		Inc. or Dec. %
	1945	1941		End of Sept. 1945	End of Sept. 1941	End of Sept. 1945	End of Sept. 1941	End of Sept. 1945	End of Sept. 1941	
Alton	\$10,892,690	\$1,170,765	+830	\$16,297,626	\$3,464,763	\$10,451,969	\$3,339,725	\$5,845,657	\$125,038	+ 4,575
Atchison, Topeka & Santa Fe	174,861,577	58,657,402	+198	250,990,979	118,838,956	135,303,828	41,283,880	115,687,151	77,555,076	+ 49
Atlantic Coast Line	38,649,716	12,823,694	+201	69,917,347	22,763,323	47,761,578	11,024,065	22,155,769	11,739,258	+ 89
Baltimore & Ohio	82,375,288	32,005,796	+157	134,476,342	57,593,956	76,419,724	28,546,091	58,056,618	29,047,865	+ 100
Boston & Maine	17,108,832	6,610,868	+159	31,494,941	15,020,621	18,920,868	11,332,144	12,574,073	3,688,477	+ 241
Central of Georgia	19,562,740	2,060,260	+850	29,195,619	6,605,629	8,440,481	4,085,946	20,755,138	2,519,683	- 18
Central of New Jersey	21,681,112	7,708,699	+181	34,306,160	13,296,299	23,417,225	7,156,374	10,889,935	6,139,925	+ 77
Chesapeake & Ohio	34,828,277	39,376,413	- 12	68,803,101	70,345,516	65,783,868	37,934,360	3,019,233	32,411,156	- 91
Chicago & Eastern Illinois	8,074,766	2,946,584	+174	12,179,868	4,983,136	6,739,871	2,260,864	5,439,997	2,722,272	+ 100
Chicago & Northwestern	45,495,880	30,861,791	+ 47	72,380,383	52,251,756	45,649,712	19,903,143	26,730,671	32,348,613	- 17
Chicago, Burlington & Q.	65,636,453	21,279,903	+208	103,780,274	46,448,243	81,111,450	18,495,620	22,668,824	27,952,623	- 19
Chicago Great Western	9,333,120	2,595,208	+260	12,773,037	5,388,421	7,074,475	3,428,985	5,698,562	1,959,436	+ 191
Chicago, Mil., St. P. & P.	88,130,126	32,345,253	+172	139,762,420	55,054,591	43,774,308	22,886,437	95,988,171	32,168,154	+ 198
Chicago, Rock Island & P.	111,448,309	15,102,997	+638	136,574,471	29,257,976	53,633,285	11,559,216	82,941,186	17,698,760	+ 369
Chicago, St. P., M. & O.	6,547,955	1,957,559	+134	10,735,381	4,815,051	5,828,117	2,868,598	4,907,714	1,946,453	+ 152
Delaware & Hudson	6,960,439	5,660,571	+ 23	14,913,633	10,356,727	6,625,412	4,683,606	8,298,221	5,673,121	+ 46
Delaware, Lackawanna & W.	14,707,864	5,320,447	+176	28,011,712	10,609,370	14,276,550	10,532,133	13,735,162	77,237	+17,683
Denver & Rio Grande Western	29,590,464	3,968,946	+646	44,864,811	9,406,809	23,902,867	9,329,786	20,961,944	77,023	+27,115
Duluth, Missabe & I. R.	21,687,022	23,344,610	- 7	26,062,383	26,426,040	16,197,242	9,723,692	8,965,141	16,702,348	- 41
Elgin, Joliet & Eastern	12,508,407	14,142,498	- 12	15,692,322	16,565,577	8,216,953	8,996,297	7,475,369	1,569,280	- 1
Erie	29,867,352	19,758,387	+ 51	55,829,072	37,490,112	27,478,930	17,281,697	28,350,142	20,208,415	+ 40
Grand Trunk Western	1,219,731	2,182,538	- 44	6,155,677	6,715,617	6,068,290	4,958,783	87,387	1,756,834	- 95
Great Northern	36,955,024	31,232,705	+ 18	88,123,420	48,853,112	37,766,935	24,685,298	50,356,485	24,167,814	+ 108
Gulf, Mobile & Ohio	12,798,342	6,033,164	+112	19,466,964	11,795,009	10,455,247	4,718,508	9,011,717	7,076,501	+ 27
Illinois Central	98,911,121	21,359,849	+363	143,120,323	48,241,749	90,294,673	27,873,398	52,825,650	20,368,351	+ 159
Lehigh Valley	16,935,092	14,131,926	+ 20	30,495,040	19,537,656	13,774,556	14,323,855	16,720,484	5,213,801	+ 221
Long Island	6,448,467	950,638	+578	11,901,067	4,604,599	7,270,747	4,865,790	4,630,320	-261,191	*
Louisville & Nashville	59,440,702	34,026,440	+ 75	109,232,464	53,292,968	64,249,861	21,809,450	44,982,603	31,483,518	+ 43
M., St. P. & S. Ste. Marie	19,278,515	5,603,959	+244	24,324,489	9,014,803	6,750,144	16,129,982	17,574,345	-7,115,179	*
Missouri-Kansas-Texas	20,723,400	3,381,480	+513	31,333,481	7,142,237	26,813,151	6,506,292	4,520,331	635,945	+ 611
Missouri Pacific	113,220,372	28,300,753	+300	164,877,276	49,103,883	80,171,772	11,676,182	84,705,504	37,427,701	+ 126
New York Central	180,892,210	39,773,886	+355	271,973,719	125,401,909	155,909,935	76,037,496	116,063,784	49,364,413	+ 135
New York, Chicago & St. L.	18,368,926	5,630,806	+224	30,076,278	22,686,088	19,533,294	16,499,315	10,542,984	6,186,723	+ 70
N. Y., N. H. & Hartford	58,567,132	8,279,120	+607	89,007,806	41,988,990	42,170,858	44,760,119	46,836,948	-2,771,129	*
Norfolk & Western	86,247,659	39,364,422	+119	109,064,813	60,814,836	57,433,807	28,513,261	51,631,006	32,301,575	+ 60
Northern Pacific	14,426,246	17,996,447	- 20	58,034,669	43,918,623	32,912,291	15,172,006	25,122,378	28,746,617	- 13
Pennsylvania	212,018,738	86,700,104	+145	349,517,552	180,993,915	206,008,919	105,366,976	143,508,633	75,626,939	+ 90
Pere Marquette	12,210,619	6,880,233	+ 77	20,479,112	13,661,357	11,099,850	7,693,574	9,379,262	5,967,783	+ 57
Pittsburgh & Lake Erie	12,112,719	7,549,528	+ 60	17,222,229	11,812,496	10,244,658	9,176,177	6,977,571	2,636,319	+ 165
Reading	21,857,391	13,548,417	+ 61	41,224,733	23,002,689	28,182,123	17,366,177	13,042,610	5,636,512	+ 131
St. Louis-San Francisco	52,271,490	16,261,539	+221	66,993,370	24,574,386	25,650,756	6,384,716	41,342,974	18,189,670	+ 127
St. Louis Southwestern	34,182,435	2,882,962	+1086	43,564,378	9,758,660	25,502,493	8,726,609	18,061,885	1,032,051	+ 1,650
Seaboard Air Line	48,564,728	8,139,827	+497	70,431,372	18,450,213	29,849,079	8,340,393	40,582,293	10,109,830	+ 301
Southern	94,218,267	15,137,662	+522	129,343,195	44,760,245	83,654,477	26,941,339	45,688,718	17,818,906	+ 156
Southern Pacific	178,550,600	29,954,259	+496	291,856,214	70,531,073	184,872,237	42,176,425	106,983,977	28,354,648	+ 277
Texas & Pacific	28,538,666	3,748,877	+661	48,352,627	11,921,546	32,433,521	5,327,044	15,919,106	6,594,502	+ 141
Union Pacific	281,680,521	43,109,403	+553	376,535,297	86,282,041	169,135,897	39,549,655	207,399,400	46,732,386	+ 344
Wabash	34,001,255	13,836,782	+146	48,285,276	21,526,525	36,999,287	6,394,111	11,285,989	15,132,414	- 25

* Current liabilities exceeded current assets in 1941.

for the purpose; which is another reason why the present current assets position must be protected from depredations by treasure hunters.

It is also worth noting that the railroads have billed the government for a considerable volume of war traffic at commercial rates. In the post-audit of these bills, the General Accounting Office is setting up claims for land-grant allowances on much of this traffic. These claims for land-grant allowances, together with claims covering the adjustment of charges on transit traffic, retroactive section 22 quotations, reparations, etc., may aggregate between \$350 million and \$500 million. A large cash reserve is necessary to protect this situation.

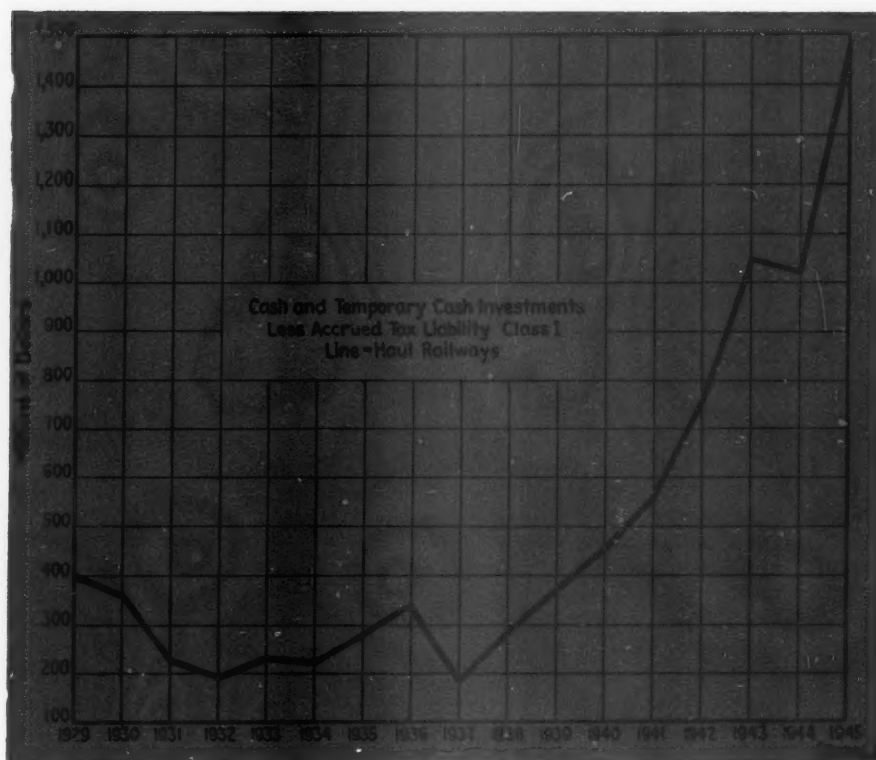
Preparing for Maturities

Railroad debt maturities in the next five years approximate \$1,711 million, of which some \$389 million are equipment obligations. The equipments must be paid off as they mature. Reduction of the other debt is not only part of the fixed policy, but may be one of the prerequisites to refunding operations. Cash reserves must be accumulated for these purposes.

The railroads' assets position, of course, has an important bearing on the capital improvements they are able to finance. In the depression years 1931-1938 gross capital expenditures averaged \$259 million a year. In the period following the first world war, 1923-1930, the average was \$843 million; and in the current war period, 1939-1944, the average was \$464 million. It is in the interest of everyone connected with the railroad industry in any way—shippers and employees as well as owners, creditors and managements—that the railroads' capital outlays be expanded, rather than that they should decline to the disastrous level of the 'Thirties.

It should be noted also that insolvent railroads are included in the total of those whose excess of current assets over current liabilities exceeds \$2 billion. These insolvent roads have to maintain a larger proportion of their current assets in cash and temporary cash advances than do the solvent roads. This is so, because they have to have cash to pay the costs of reorganization. Furthermore, they may be required to pay some part, but of course not all, of defaulted interest, which, on September 30, 1945, amounted to \$955 million.

The railroads generally have indicated that they will take advantage of the provision in the Internal Revenue Code which authorizes a shortening of the period over which the cost of war-time facilities may be amortized for tax purposes. On September 30, 1945, the estimated unamortized cost of emergency facilities was over \$500 million. The spreading back of this sum to prior tax



years will produce tax credits of approximately 60 per cent of the increased allowances, or \$300 million. These credits will serve to reduce the present balance carried in the accrued taxes account, which is treated as a part of current liabilities. Approximately 90 per cent of the cost of emergency facilities subject to rapid amortization was in respect of equipment financed in part through equipment obligations, including conditional sales agreements, due over a period of about ten years. The tax credits arising from the amortization allowances are a potential source of funds for the discharge of the unpaid debt.

The railroads hold some \$77 million face amount of post-war excess profits tax refund bonds. Under the provisions of the Tax Adjustment Act of 1945 these bonds become subject to redemption on and after January 1, 1946. These bond holdings are not shown in the current asset account as presently stated.

Effect of Profits Tax End

It is difficult to assess what the benefit to the railroads will be from the disappearance in 1946 of the excess profits tax. If railroad earnings are maintained at reasonably high levels, that is, in excess of their excess profits tax credits, the companies will, of course, be allowed to retain a larger part of their earnings for corporate purposes. On the other hand, unless earnings are relatively high, the taxable income would not exceed the credits, and the presence or absence of an excess profits tax, regardless of the rate, would have no significance. If

the railroads should have no net taxable earnings in 1946, or if these earnings should be substantially less than their computed excess profits tax credits for that year, the companies would be able to recover some part of the excess profits taxes paid for the years 1944 and/or 1945 through operation of the "carry-back" provisions, which remain in force for one year following repeal of the excess profits tax.

Good, But Not Too Good

The conclusion must be, when all the conflicting evidence is weighed, that the railroads' current assets position is a strong one—but not any stronger than is called for by the exigencies of their present situation. This assets position, if the importance of protecting it from predatory raids is recognized, gives strong assurance that capital improvements will go forward to the full extent justified by earnings. Speaking generally, it may be said that, as long as this strong current assets position is maintained or that these assets are used in part for capital outlays, it may be expected that railroad capital outlays will continue at a substantial level. With this assets position maintained, the railroads can use all further earnings for a constructive purpose—to make capital improvements or to pay dividends and interest to investors, thereby encouraging them to finance improvements. This is a considerable improvement over the situation which persisted so long in the 'Thirties, where almost every dollar earned had to be pressed into service to satisfy an overdue obligation.

Results of Research Will Guide Railroads

Study committee is now shaping up basic reports as it rounds out program which has been under way for 3½ years—Economic surveys provide data for Parmelee's tentative forecast indicating that 1950 traffic will be above 1940 level but lower than wartime peaks

ROUNDING out the comprehensive research program which it has been conducting for the past three and one-half years, the Railroad Committee for the Study of Transportation is now shaping up its basic reports to guide the industry in the post-war era. The committee is headed by Judge R. V. Fletcher, vice-president—research, Association of American Railroads, and its studies, covering all phases of railroading and trends which may affect railroading, have been carried on by 15 subcommittees with a total membership of more than 100 drawn from all departments and branches of the industry.

The *Railway Age's* latest general review of the committee's work appeared in the last Annual Statistical and Outlook Number—the issue of January 6, 1945, page 6. Since that time, when 16 reports had been published, the committee has issued five others and progressed its remaining studies to the point where it now expects to complete its whole job during the current year.

Among the basic studies are the general economic surveys and forecasts being made by the Subcommittee for Economic Study, headed by J. V. B. Duer, assistant to vice-president, Pennsylvania, which has also been working on a group of specific commodity studies. The general economic phase of the subcommittee's assignment is being conducted under the supervision of Dr. Julius H. Parmelee, director of the Bureau of Railway Economics; and, while the findings are still in preliminary form, sufficient material had been gathered by November 1 to enable Dr. Parmelee to draw what he called some "rather general and tentative conclusions."

Sees 1950 Traffic Above 1940

This the B. R. E. director did in a November 1 address before the National Postwar Conference at Atlantic City, N. J., emphasizing that the ideas expressed were his own and "subject to further study and revision." On that basis Dr. Parmelee took a cautious look ahead to 1950, seeing railway traffic in that year on a higher level than in 1940 but lower than in the war years 1941 to 1945. Meanwhile, as he sees it, the railroads will have held their relative place

By **WALTER J. TAFT**
Washington Editor

Twenty-one reports on various phases of railroading and trends which may affect railroading have thus far been completed by subcommittees of the Railroad Committee for the Study of Transportation. This article brings up to date the story of that comprehensive research program which was launched by the Association of American Railroads 3½ years ago under the direction of Judge R. V. Fletcher; and which should be finished during 1946.

Among the committee's studies are the general economic surveys, on the basis of which Dr. Julius H. Parmelee recently took a cautious look ahead to 1950, seeing railway traffic in that year on a higher level than in 1940 but lower than in the war years.

Reasons why, in this paper's opinion, the outlook for traffic and earning may be considerably brighter than forecast by Dr. Parmelee are set forth in the leading editorial in this issue.

in the competition for freight traffic, but will show a relative loss in the passenger field.

The forecast is based on Dr. Parmelee's analysis of trends in manufacturing, the output of minerals, agricultural production, and railroad traffic during World War I and its aftermath and during the period since 1940. Before getting into specific figures, however, the B. R. E. director noted that the three general characteristics of economic trends accompanying previous major wars have been: "First, a high level of production during the war; second, a short period of reconversion, or readjustment, immediately following the war;

third, a considerable period of post-war expansion." In each case, he added, the expansion period carried economic levels in the United States above those of all pre-war periods; and the situation following World War II "seems likely to pursue these same general lines."

Dr. Parmelee's index numbers covering the World War II period were based on the year 1940 as 100. He calculated that the index of total manufacturing, which reached a wartime peak of 205 in 1943, would hit a low point "close to 100" in 1946, after which "there should be gradual recovery to perhaps 125 in 1950." The minerals index, which reached its high of 126 in June, 1945, is expected by Dr. Parmelee to continue its current decline "well into 1946," then coming back to about 110. The index of agricultural production reached 124 in 1944. As the B. R. E. director reads the signs, this index will probably be less than 110 in some 1946 month, but it will have returned to that figure by 1950.

The Forecast

"The same general conclusions seem reasonable as to post-war railroad ton-miles," Dr. Parmelee went on. "We expect ton-mileage to be greater in 1950 than in 1929, which was the pre-war peak year, greater in 1950 than in 1940 by about 33 per cent, but lower than in any of the war years from 1941 to 1945.

"The prospects with respect to railroad passenger-miles are less favorable, although the tremendous effect of the war raised the index from 100 in 1940 to 400 in 1944. A rather heavy passenger movement is anticipated for the balance of 1945, and to about the middle of 1946, growing in part out of extensive transfers of troops from Atlantic and Pacific ports to their homes, and in part dependent on the fact that the automotive industry will not yet have reached its post-war level of production of automobiles and buses. Following 1946, however, we expect aggregate railroad passenger miles to decrease rather steadily, reaching a level in 1950 above that of 1940 but below all of the years from 1942 to 1949, inclusive."

How the outlook on the foregoing basis compares with past records was indi-

cated by Dr. Parmelee, with the following revised figures, as follows:

Railways of Class I (Figures in Billions)

	Ton-miles	Passenger-miles
First World War Peak (1918)	405.4	42.7
Interwar Peak:		
Ton-miles (1929)	447.3	
Passenger-miles (1920)		46.9
Prewar (1940)	373.3	23.8
Second World War Peak (1944)	737.2	95.5
Prospects for		
1945	680.0	91.0
1946	500.0	65.0
1950	496.0	35.0

Sees \$6 Billion 1950 Gross

Emphasizing again that these indicated traffic levels for 1950 "are only tentatively advanced," the B. R. E. director proceeded to calculate that they would (at current rates and fares) produce a total operating revenue in 1950 of about \$6 billion. This would be below the total of about \$6¼ billion of gross earned in 1929, but would be greater than that of any of the years from 1930 to 1941, inclusive. But Dr. Parmelee pointed out that it would produce "considerably less net earnings than in 1929 because of the great increase in wage rates, prices and taxes since 1929."

To assume that railroad rates will remain stationary while all other components of the price level increase is, of course, quite arbitrary. Since reasonable railroad earnings are necessary in the public interest, there is no justifiable reason why rates should not rise to permit the railroads, with the traffic foreseen for 1950, to equal in that year the net earnings they had in 1929.

Dr. Parmelee mentioned the findings of other subcommittees which are studying the prospective distribution of post-war traffic among the various agencies of transportation. In that connection he gave figures indicating that total ton-miles of all agencies in 1950 will be 27 per cent above the 1940 total, while total passenger-miles will be up 29 per cent. Here is where the B. R. E. director suggested that the railroads will hold their relative place as carriers of freight but lose ground relatively in the passenger field.

"The greatest relative increase in freight traffic from 1940 to 1950, amounting to 100 per cent, is anticipated in the air," he said. "That agency, however, handles a very small proportion of the total freight movement, considerably less than 1/100 of one per cent in either 1940 or 1950. Pipeline traffic is expected to increase 38 per cent, truck traffic 27 per cent, and railroad traffic 33 per cent, compared with an increase of 27 per cent in total freight traffic. In brief, the railroads are expected to hold their own with other agencies, their proportion of total freight traffic being about 62 per cent in 1940 and 1950.

"In the commercial passenger field, the

greatest relative increase between 1940 and 1950 will again be in the air. That agency will have increased its passenger-mileage nearly six times during those ten years. Thus air passenger traffic is becoming an appreciable transportation factor, rising from 2.7 per cent of the total in 1940 to an estimated 28 per cent in 1950. Buses are expected to handle an increase in passenger-miles, 1940 to 1950, but to show a slightly smaller proportion of the total, 28 per cent in 1950 as against 30 per cent in 1940.

Railroad passenger traffic will also increase between 1940 and 1950, but will show a decrease in relation to total commercial passenger traffic from 61½ per cent in 1940 to an estimated 60 per cent in 1950."

Dr. Parmelee's conclusions as to outlook for business generally are that the post-war scene "is set for high economic levels," and the factors supporting them will be attended by the country's long-term trend of continued growth, increasing productive efficiency, technological improvements, greater earnings, and higher standards of living. The favorable factors, he said, "spell potential prosperity," but prosperity can be delayed by failure to solve certain "conditioning problems." Among these he listed the attainment of high levels of employment and avoidance of long periods of large-scale unemployment; improvement in labor-management relations; adjustment of cost-price relationships so that producers are assured a suitable margin of profit in a time of rising costs, with prices held to designated ceilings; control of prices and prevention of either inflation or deflation; prudent management of the public debt and the resultant tax burden; orderly demobilization of wartime economic controls.

Commodity Reports

Meanwhile the other division of the Subcommittee for Economic Study has proceeded under the direction of Loyd J. Kiernan with the preparation of its specific commodity reports. This assignment was broken down into studies of approximately 40 commodities or commodity groups, and reports on 23 had been accepted by the general committee as of January 1, when most of the others were complete except for editorial checking and mimeographing. Since these commodity reports are primarily for the use of railroad traffic officers and will be used by the Subcommittee on Traffic, only one of them has been made public. It is the report on "Raw Cotton and Cotton Linters" (reviewed in the *Railway Age* of December 16, 1944, page 934), which was released as a contribution of the railroads to the work of the December, 1944, Congressional Cotton Conference in Washington.

Conforming to a basic pattern which was adopted in the interest of uniformity, the commodity reports start with a description of the product, a brief explanatory outline of definitions, trade terms, and trade practices, and a summarized history of the industry. Successive chapters are devoted to production, consumption, foreign trade if any, marketing methods and channels, price methods and fluctuations, and a chapter on transportation. The latter discusses the transportation characteristics of the commodity, types of equipment used for its movement, special services needed, statistics of rail movement and the principal available facts bearing upon competition from other means of transportation.

The discussions of all these subjects are supported to the extent deemed necessary by pertinent statistical tabulations, and certain phases of each report are supported by maps and charts or graphs. In the case of what are considered basic statistics, the figures are carried back as far as 1909, if available. The culmination of each report is a chapter of conclusions and comments, the essential feature of the conclusions being a statement of the tonnage of the commodity in question estimated to be available for movement by all forms of transportation in the first "normal" post-war year. The estimate is broken down geographically according to origins and destinations, and it is accompanied by conclusions on any other phases of the subject thought to be of pertinent interest to the railroads.

Along with their primary purpose of presenting estimates of post-war traffic movement, the commodity reports have the secondary purpose of providing reference material of lasting value to the railroads. A railroad which desires to adapt the reports to its own special needs will find all of the necessary basic data in readily usable form. As Mr. Kiernan has put it, "When all our reports are completed, we shall have for the use of the railway industry what amounts to a commodity encyclopedia of the United States."

Three Groups Finish Studies

The Subcommittee on Consolidations, headed by C. E. Smith, vice-president of the New York, New Haven & Hartford, completed its work during the past year with the publication of a final report which was reviewed in the *Railway Age* of July 21, 1945, page 105. The principal recommendation was that the railroads "continue to pursue a policy of consolidation along natural and evolutionary lines, subject to the safeguards provided in the Interstate Commerce Act." Two other subcommittees had previously completed their assigned studies during 1944. They are the Subcommittee on Public Relations, of which

Robert S. Henry, assistant to president, A. A. R., is chairman; and the Subcommittee on Pipeline Transport, headed by W. G. Vollmer, president of the Texas & Pacific. The former is now concerning itself with assisting in the preparation and distribution of reports of other subcommittees, while the Subcommittee on Pipeline Transport is standing by prepared to make other studies if called for by any new developments.

The Subcommittee on Accounting and Statistics, under the chairmanship of G. T. Carmichael, vice-president and comptroller of the New Haven, has issued one report and is preparing at least four others which it expects to complete by July 1. The published report deals with "Simplification and Consolidation of Divisions for Apportioning Interline Freight Revenues and Uniformity in Division Publications," while those in process will cover such subjects as ticket printing machines, the use of teletype and tabulators for yard statistics, the unit bill of lading, and simplification and standardization of joint facility billing. In addition, this subcommittee is considering certain other reports on interline freight and passenger fare divisions.

Keeping Air Study Up to Date

Rapid changes in the techniques of air transport have made incomplete in some respects the "Initial Study of Air Transportation," issued early in 1944 by the Subcommittee on Air Transportation, and that report is now being brought up to date for publication as a new booklet or for inclusion in the final report of the subcommittee. Meanwhile, the subcommittee which is headed by L. F. Whittemore, assistant to president, Boston & Maine, has submitted to the general committee a report on "Railroad Participation in Air Transport"; and it has completed, except for final revisions, a "Study of Fruits and Vegetables in Air Transport." The latter will probably be included in the subcommittee's final report, rather than being published as a separate document.

As pointed out in previous reviews, the early work of the Subcommittee on Engineering and Mechanical Research was largely devoted to investigations and recommendations pertaining to the creation of the Department of Research in the A. A. R. Formerly headed by A. E. Perlman, chief engineer of the Denver & Rio Grande Western, this subcommittee now has for its chairman A. A. Miller, chief engineer, maintenance of way, Missouri Pacific. With the assistance of the Department of Research's staff it is now preparing a complete report of the research activities of the A. A. R., the American Railway Engineering Association, the principal railroads, and principal railroad supply companies. The survey will compare

the results of this research with those achieved by some twenty leading industries, thus laying the basis for a follow-through to conclusions on a permanent program of research for the railroad industry. The final report of this subcommittee is expected to be completed by July 1, and it will probably include a report on light-weight freight cars.

The Subcommittee on Finance, of which R. E. Connolly, vice-president of the Illinois Central, is chairman, has thus far made public no reports since its work depends on current developments. Its final reports will deal with the financial problems which confront the railroads in the competitive era ahead.

As was the case a year ago, the Subcommittee on Labor and Personnel, functioning under the chairmanship of L. W. Horning, vice-president—personnel, New York Central, remains the most active report publisher. It has thus far completed 13 reports on various phases of labor and personnel problems and expects in its final report to consolidate them all into a single volume. This subcommittee's reports have met with widespread popularity, and it is planned to print probably as many as 20,000 copies of the consolidated report, with a view to placing it in the hands of every railroad officer who has important supervisory responsibilities. In addition, copies will be distributed to libraries, schools, and colleges.

The principal recent activity of the Subcommittee on Legislation, of which Judge Fletcher is chairman, has been the gathering of material to be submitted to the House committee on interstate and foreign commerce in connection with the "national transportation inquiry" which that committee has undertaken. After all reports of the other subcommittees have been completed this legislative subcommittee will prepare any further recommendations required.

Motor Transport

The Subcommittee on Motor Transport, headed by H. R. Lake, general manager, Department of Highway Motor Transport, Atchison, Topeka & Santa Fe, has recently completed a 389-page report, not yet formally approved by the general committee. This analysis of highway transportation consists of five sections: (1) Factors common to the development of all highway transport; effect of the war; future outlook for highway transport; and rail-highway operations; (2) highway transport of property; (3) highway transport of passengers by for-hire carriers; (4) highway transport by private passenger automobiles; (5) appendices containing information and pertinent statistics.

At the October meeting of the general committee, the Subcommittee on Operating Methods and Procedures submit-

ted a report on deferred maintenance, which is now being studied and revised in the light of suggestions made by general committee members. It will probably be presented for final approval this month; and sometime next month the subcommittee expects to have completed its report on coordination of facilities. By July 1 it promises reports on additional subjects such as heavier loading of cars and unnecessary passenger train mileage. J. M. Symes, vice-president of the Pennsylvania, is the chairman.

Taxation and Traffic

The work of the Subcommittee on Taxation, of which Karl W. Fischer, assistant to president, Chicago, Burlington & Quincy, is chairman, will be concluded upon acceptance by the general committee of its second report, entitled "Inequality of Taxation Among the Several Forms of Transportation." This report was submitted to the general committee late last year. The subcommittee's other report, already made public, is "Some Recommendations for a National Post-war Fiscal Policy."

The Subcommittee on Traffic is operating under the chairmanship of F. J. Wall, vice-president of the New Haven. As indicated above, much of its work will be based on the commodity reports prepared by the Subcommittee for Economic Study. It will also require the findings of the subcommittees on air, motor, pipeline, and water transport, thus becoming of necessity one of the last groups to complete its work.

Meanwhile, its own investigations are proceeding satisfactorily, including its shipper surveys and studies of freight sales and development, merchandise traffic, and carload commodities. In the field of passenger traffic the subcommittee has almost completed an important report covering such subjects as the competitive outlook, the private automobile, airline competition, railroad basic passenger fares, various types of passenger equipment and terminals, and the branch line situation.

The Subcommittee on Water Transport, with E. A. Smith, senior general attorney of the Illinois Central as its chairman, completed a report on the Mississippi river several months ago. This has been approved by the general committee and distributed to A. A. R. member roads. Also completed are reports on intercoastal traffic and the New York State Barge Canal; while the additional studies under way will cover other waterways.

While plans are not yet complete, at least 10,000 copies of the general committee's final report will be printed for distribution to universities, libraries, economists, and legislators, as well as persons in the transportation industry and the interested general public.



Increasingly heavy troop movements continue to place a heavy strain on the available man-power of Western carriers

Peace Has Not Solved Labor Problems

Man-power shortages continue, especially in the maintenance of way department—Unions demand greatly increased pay

*By THE CHICAGO STAFF**

EVEN though many war plants have shut down, releasing thousands of employees to civilian pursuits, and despite the fact that over 10 per cent of the railway employees who were in military service are back on the job, man-power shortages will continue on the railways. In fact, in certain areas and in certain departments, the problem is nearly as acute as it ever was. It is not expected that normal conditions in the railway labor field will return, so far as man-power supply is concerned, until well along in 1946.

Meanwhile, the armed truce existing between railway management and employees has come to an end. In 1943 the unions began fretting and stewing, culminating in a strike order that was to have been effective on December 30, 1943. To avoid tying up the railways in war-time the late President Roosevelt issued an executive order directing the

Secretary of War to take possession and control of the nation's railways effective December 27, 1943. The final outcome was advances in wages of 9 to 11 cents an hour which were much larger than the advances recommended by the "emergency boards" appointed by the President. The Army returned the railways to their owners on January 18, 1944.

From then until V-E Day an uneasy peace was maintained, but in June, 1945, the first of the demands of the non-operating unions were presented, to be followed soon by requests from the operating brotherhoods. These demands had been jelled by late November, when the three carrier conference committees began meetings and negotiations with the union officers in Chicago. The non-ops want 30 cents per hour increase, while the operating employees want 25 per cent. The Brotherhood of Railroad Trainmen and the Brotherhood of Locomotive Engineers also want changes in

working rules, the other three brotherhoods being content, for the present, to demand merely pay increases.

Vacancies Drop After May

Unfilled openings for railway employment during 1945 were somewhat lower than in 1944, and reached their peak for the year in May when unfilled openings totaled 100,860. Since that month there has been a steady downward trend except for a slight rise in September. On November 30, the number of vacant jobs reported had been reduced by one-half to 50,264.

A major factor in keeping the monthly total of vacant jobs below the level of 1944 was the employment of large numbers of Mexican workers on United States railroads. First employed in 1943, the number of Mexican citizens at work on railways in this country reached a peak of approximately 69,000 men in August of last year. With the

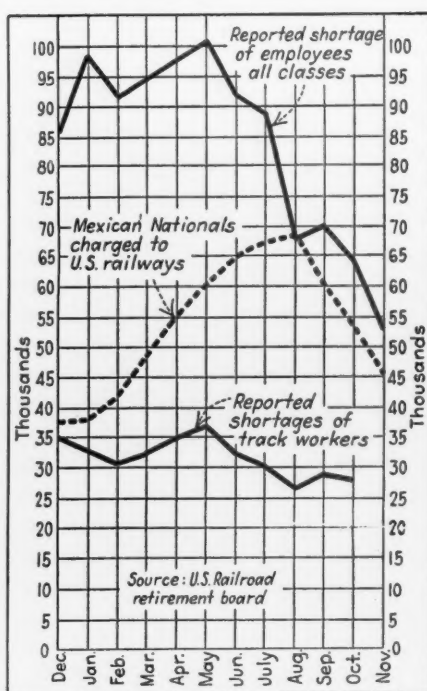
* Charles Layng, N. D. Howard, E. L. Woodward and C. C. Robinson.

collapse of Japan in that month, the War Manpower Commission, on August 20, ordered that the importation of Mexican labor for railway work be ended and that those now employed in this country be returned when their contracts expire. Present indications are that although there will be no such contracts in force after February 28, it will be some time after that date before all have returned to Mexico.

From the chart it will be observed that the sharp down turn in unfilled railway jobs occurred in May, the month of the German collapse. Not so evident is the second sharp break following V-J day in August. However, if the effects of the relatively rapid return of Mexican workers to their homes is considered, it is apparent that the actual rate of improvement in the railway man-power situation has been more rapid than mere figures of total unfilled openings would indicate.

Improvement Varies by Areas

Although there has been marked improvement in the man-power situation on a national basis, the rate of improvement has not been uniform in all regions nor in all occupations. Table I shows the number of unfilled openings in the railroad industry as of October 31 and November 30. Notable is the



Relationship between employment of Mexicans on U. S. railroads and reported shortages of railway workers

gain in the San Francisco area, which because of the tremendous flow of traffic caused by the unprecedentedly rapid return of service men, has been a par-

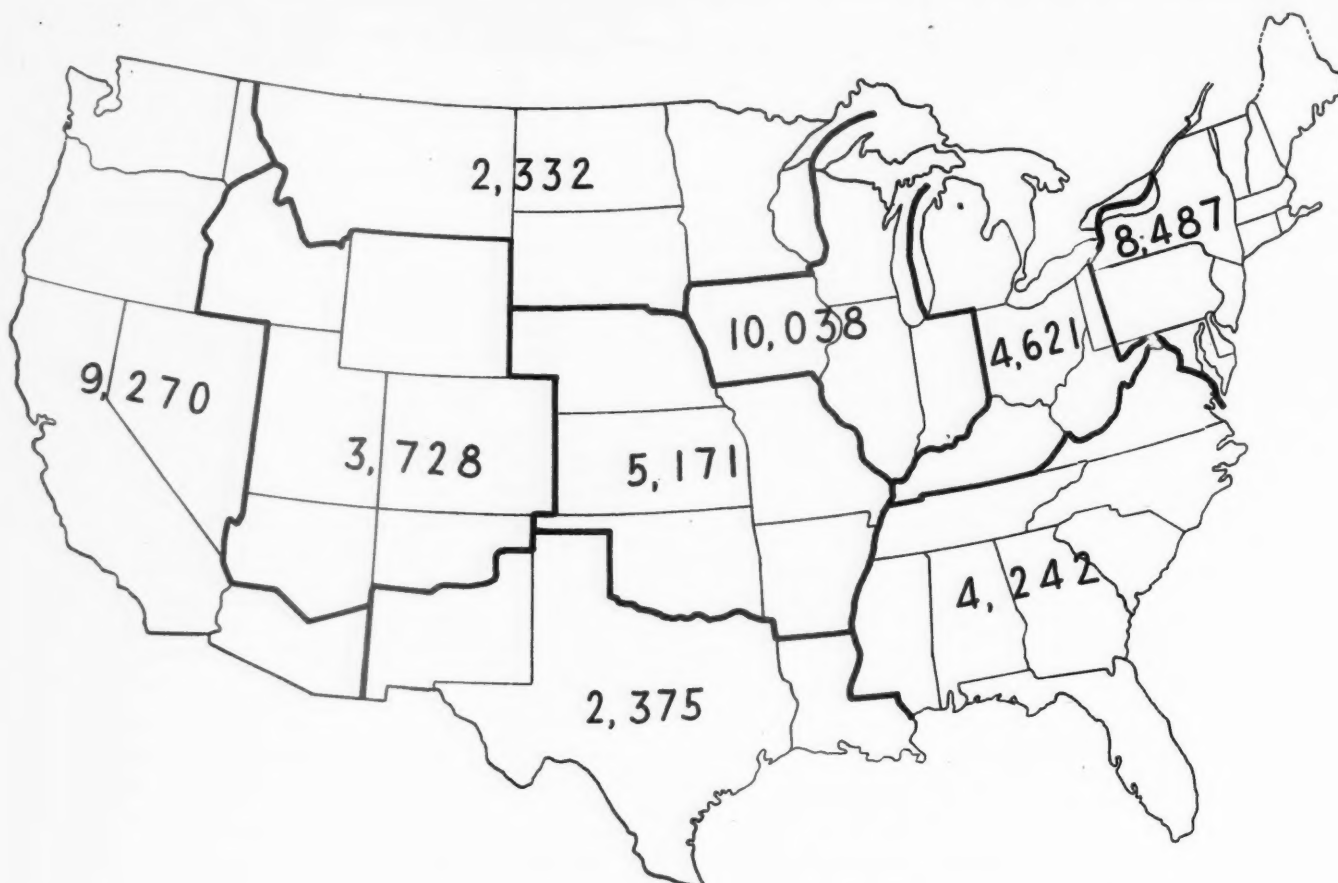
ticularly troublesome region. Also notable is the continued high place in the total of the Chicago region, largely due to difficulty in securing freight house and track labor in the immediate vicinity of Chicago itself.

Table I—Unfilled Openings on Order at End of Month

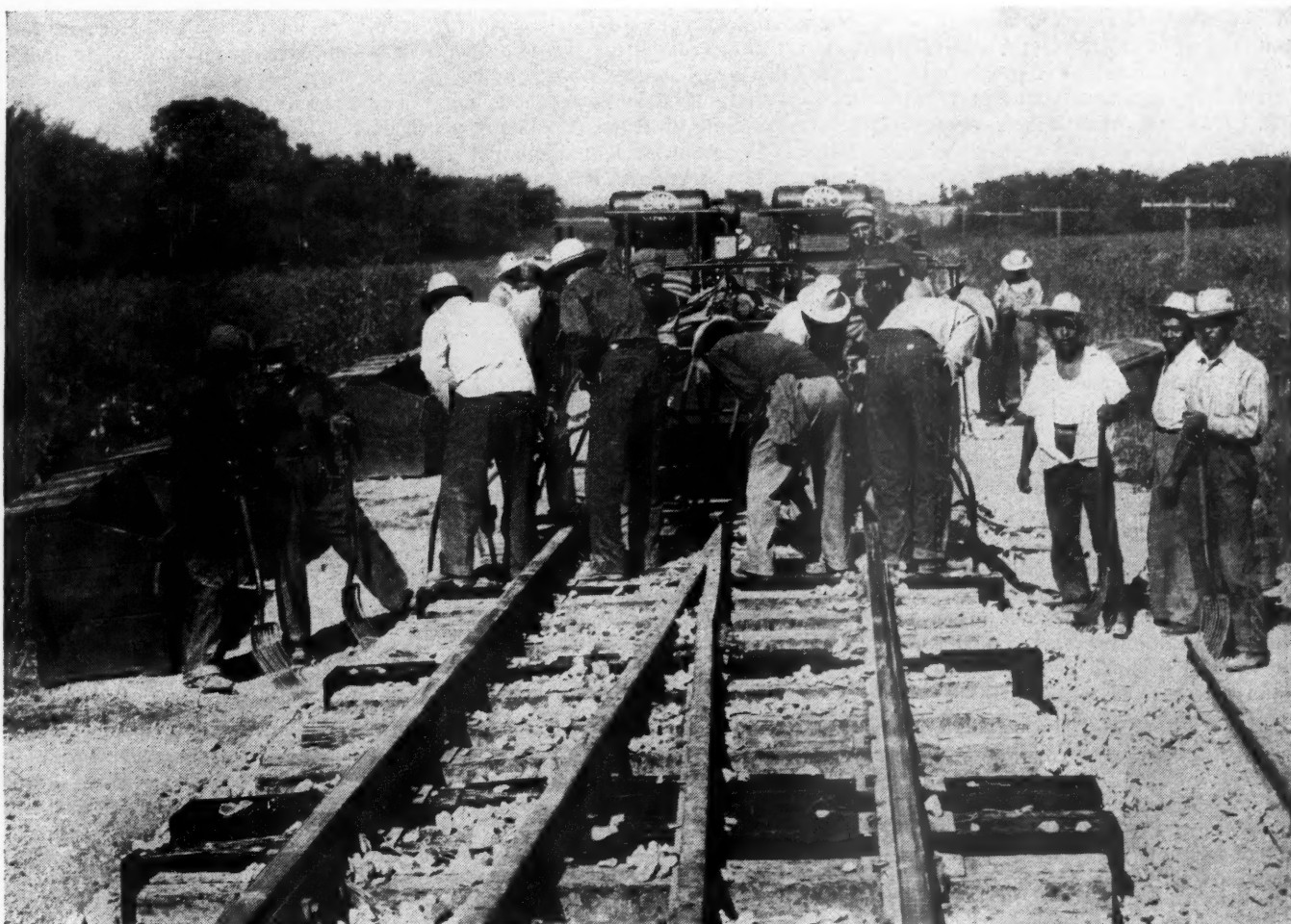
Region	October 31	November 30
1. Atlanta	3,959	4,242
2. New York	9,793	8,487
3. Cleveland	6,567	4,621
4. Chicago	11,883	10,038
5. Dallas	3,270	2,375
6. Kansas City	6,599	5,171
7. Minneapolis	3,317	2,332
8. Denver	5,672	3,728
9. San Francisco	12,960	9,270
Total	64,020	50,264

In analyzing the man-power picture it is found that by far the largest shortages continue to occur in what might be termed the common labor occupations, such as track workers, freight handlers, store and roundhouse laborers, etc. In the field of skilled labor there has been in general much improvement, particularly in the operating department, although skilled mechanical department and maintenance of way employees are still desperately short in certain areas.

In contrast to the situation existing a year ago when many railroads were striving desperately to secure permission of the W. M. C. for inter-regional and national labor recruitment, only five requests for Railroad Retirement Board assistance were in effect on December 1.



Unfilled openings for railway employment, by regions, as reported to the United States Railroad Retirement Board, as of November 30, 1945



The forced return of the imported Mexican railroad workers to Mexico, under way since V-J day, is leaving large gaps in the ranks of the track forces of many roads.

and some of these were so limited in their scope as to be virtually ineffective. Most of these orders, which have all been placed by western lines, are for skilled shopmen of various kinds—carmen; certain highly trained maintenance department workers such as signalmen, bridge and building carpenters, and water service mechanics; and telegraphers. Only one road now desires assistance in recruiting train dispatchers and only one is seeking aid in finding brakemen and switchmen, previously three of the most desperately needed classes of employees. Table II shows selected unfilled railway positions as reported to the Railroad Retirement Board as of October 31.

Table II—Unfilled Openings in Selected Railway Occupations as Reported by Railroad Retirement Board, Oct. 31, 1945

Bargeman	137
Blacksmith	119
Blacksmith Helpers & Apprentices	71
Boilermaker	525
Boilermaker Helpers & Apprentices	322
Brakemen	1,022
Brakemen, Student	98
Car Cleaner	310
Car Inspector	139
Carman	2,603
Carman Helper & Apprentices	1,341
Carpenter	277
Carpenter Helpers & Apprentices	233

Carpenter, B. & B.	1,541
Carpenter, B. & B. Helper & Apprentices	1,510
Clerk	1,513
Coach Cleaner	471
Conductor	78
Cook	199
Dispatcher, Train	1
Electrician	202
Electrician Helpers & Apprentices	35
Engineers & Motormen, Locomotive	39
Engineers, Stationary	16
Engineers, Technical; Draftsmen & Rodmen	86
Firemen, Locomotive & Hostlers	200
Firemen, Locomotive; Student	10
Fireman, Stationary	42
Flagman, Crossing	129
Foreman, M. of W.	211
Foundry Helper	36
Freight, Mail, Baggage & Express Handlers	4,524
Helper, Miscellaneous	516
Helper, Station	50
Ice Handler	590
Ironworker	53
Janitor	139
Kitchen Helper	104
Laborer, B. & B.	531
Laborer, Marine	135
Laborer, Miscellaneous	291
Laborer, Shop	4,558
Lineman	151
Lineman Helper	83
Machinist	1,715
Machinist Helpers & Apprentices	1,314
Mechanic	41
Mechanic, Auto	46
Mechanic, B. & B.	28
Mechanic, B. & B. Helpers & Apprentices	16
Molder	31
Oiler	77
Painter	158
Painter Helpers & Apprentices	56
Painter, B. & B.	241
Pipefitter	207
Pipefitter Helpers & Apprentices	64
Porter, Sleeping Car	705
Porter, Train	10
Sheetmetal Worker	217

Sheetmetal Worker Helpers & Apprentices	32
Signalman	278
Signalman Helpers & Apprentices	540
Steward	31
Storekeeper Helper	150
Switchman	807
Switchman, Student	80
Switchtender	50
Telegrapher	1,302
Telegrapher, Student	125
Tie Handler	58
Trackman, Extra Gang	13,541
Trackman, Section	14,385
Upholsterer	58
Waiter	253
Watchman	74
Water Service Helper	67
Water Service Man	109
Welder	63
Welder, Helpers & Apprentices	29

If the end of the war has brought an easing of man-power shortages, it has also brought to the fore equally difficult personnel problems, largely concerned with the placement of returning service men. While there were numerous cases of discharged veterans returning to civilian life prior to V-E day, it was not until after that time that the return of men began to reach large proportions. Since that time large numbers of men have been discharged and it is now estimated that 10 per cent of those released to serve in the armed forces have returned to their railway positions.

One of the major unsolved problems

of this type is the question of whether or not armed service guarantees a veteran the right to his old job regardless of seniority, certain lower courts having so ruled in cases involving manufacturing industries, while other courts, in other cases, have held that what was intended was that the veteran be restored to his place on the seniority roster and that he be allowed to claim any position to which his seniority and qualifications entitle him. This last interpretation is in line with the practices desired by both railway managements and rail labor organizations and seems likely to be followed unless outlawed by the courts. To date no cases involving the railroads have been filed.

Looming large in any survey of the railways' adjustment of working forces to the return of service personnel is the question of what the effect on railway unemployment will be if all those having previous railway experience desire to return to their old positions. It is a fact that on almost every road in the country the seniority roster is swollen far beyond the size necessary to handle even the record-breaking war traffic, let alone a normal volume of peace-time business. Consequently the spectre of large-scale railroad unemployment haunts many.

First, of course, the volume of post-war business is a major factor in determining whether or not this will be a

serious problem. While it is somewhat outside the province of this article to forecast future rail business, it is proper to say that many foresee a post-war volume of freight business at about the level prevailing in 1941, a year of a fairly high traffic level although not a record peace-time year. Passenger traffic is expected by many to be somewhat above the pre-war volume. Given such conditions the railroads can offer reasonable opportunities for a high employment level.

Will Veterans Return?

Second there is the question of how many service men will desire to return to their former employment. Here again there are no reliable measuring sticks, but if the experience of one road which has kept in contact with more than 32,000 furloughed employees is accepted as a criterion, it would appear that about 90 per cent of the railroaders in service desire to return to the industry. Certainly, in spite of the fuss and bother about rail wages and working conditions being raised by the organizations in connection with the current wage negotiations, there is considerable evidence that returning service men do find rail jobs attractive.

A final factor which will determine the ability of the railroads to absorb re-

turning veterans is the rate of retirements, deaths and quits. Here we are in a somewhat better position to judge what may be expected to happen as definite figures on retirements, at least, are available. It is common knowledge within the industry that many employees, for patriotic reasons and out of loyalty to their employers, remained on the job long past the time when they normally would have retired. Table III, which shows the number of applications for retirement made to the Railroad Retirement Board each month, clearly shows the rapid increase in requests for annuities since V-E and V-J days.

Table III—Applications to Railroad Retirement Board for Annuities During 1945

January	1,984	June	2,200
February	1,745	July	2,175
March	2,145	August	2,525
April	1,990	September	2,425
May	2,175	October	3,175

Total 22,539

In the view of one prominent personnel officer, the problem of placing the returning war veteran, on his road at least, is not expected to be difficult if the anticipated traffic volume develops. He advises that the first to be released will be a large number of women who are now employed in occupations for which they are not particularly fitted, women who accepted jobs pending the return



On a number of roads the shortage of bridge and building carpenters and other craftsmen is large—larger than it was a year ago

from military service of their husbands, and a relatively small body of undesirables who were hired as a last resort when the Selective Service Boards and general industry, along with the railroads, had already taken the entire supply of desirable man-power.

The above, of course, has all been written about the veteran who, on his return, is qualified to resume his former employment. But what of the veteran who returns incapacitated? What of the man who has acquired a new skill and desires to use it, yet remain in the industry? Here are two dissimilar, yet related problems. Each involves a transfer from one occupation or craft to another. In the case of the disabled veteran, if the man is capable of further employment it is not usually difficult to arrange with the railway labor unions to make a transfer of seniority which enables a fairly satisfactory adjustment to be made. In the example of the veteran who has acquired a new skill, a more difficult problem is presented unless there happens to be a shortage of men trained in the veterans' new skill. About all that can be said is that most railway personnel officers are alive to the problem and are meeting it to the best of their abilities. However, each case is a separate problem in itself and must be considered on its own merits.

A.A.R. Studies Personnel

A final development in the field of railroad man-power has been the work of the Association of American Railroads' Subcommittee on Labor and Personnel of the Railroad Committee for the Study of Transportation, of which L. W. Horning, vice-president, personnel, New York Central, is chairman. This committee has made notable progress in its assignment, viz., a study of the entire subject of railway labor and personnel practices, except wages. To date it has issued reports on the following subjects:

1. Re-employment of ex-service men and women.
2. Selection and hiring of new employees.
3. Introduction to the job—employee manual. (Not yet released).
4. Sharing information with employees.
5. Employee service clubs.
6. Employee suggestion systems.
7. Toilet and washroom facilities.
8. Group insurance.
9. Credit unions.
10. Recreational activities.
11. Training and promotion.
12. Public relations training.

The subcommittee has issued a general statement outlining the nature of the problem and the function of a personnel department. This document also sets forth the reasons why an affirmative policy of personnel practices is needed by the nation's rail carriers and contains the conclusions and recommendations of the group.

At the beginning of the new year the labor situation in the maintenance of way

and structures departments of the railroads, to use a military phrase, is "confused." Official reports of the Railroad Retirement Board for the railroads as a whole show the situation considerably improved over that of a year ago with respect to the total number of unfilled orders for maintenance labor of various classifications, and somewhat improved over the situation that existed on V-J Day, but reports from individual roads in various parts of the country, even where the heavy work season is now at a close, show shortages still widespread in some categories, although varying widely with general or local conditions. Furthermore, while there are a number of factors which should have a favorable influence on the situation in the months immediately ahead, there are so many offsetting factors that most maintenance officers find little cause for optimism as to meeting their overall requirements for labor during the first six months of the year. Expressed more accurately, some are less pessimistic than others, for the general tenor in all parts of the country, viewing individual railroads as a whole, is anything but optimistic.

In the face of the thousands of able-bodied men thrown on the labor market by the closing down of war plants, shipyards, and most auxiliary military production, and the return of equal numbers of veterans to civilian life, the labor situation thus reflected is little less than amazing, but it is nevertheless real and must be reckoned with. More and more there is evidence that the majority of common labor, fattened by the plush conditions that prevailed in most war industries, is shying away from the manual effort called for in most classes of track maintenance, and especially where their assignments are away from home or urban centers. How long this situation will prevail is anyone's guess, but while it prevails it is certain to present the maintenance of way departments with severe handicaps, if not serious problems, in many sections of the country.

Overall Figures Better

On the basis of unfilled orders for maintenance of way and structures workers as compiled by the Railroad Retirement Board, the labor situation is far more favorable than during the peak labor shortage that prevailed in October, 1943, and even considerably improved over the situation that prevailed a year ago this time. As of October 31 last, the latest date for which figures are available by employment classifications, the records of the Board show unfilled orders among maintenance of way and structures employees as approximately 32,800, a decrease of 31,200 from the

peak unfilled orders reported in October, 1943, and a decrease of approximately 6,000 from the reported unfilled orders as of October 31, 1944.

As throughout the war, the greatest shortage in maintenance of way employees is still in section and extra-gang labor, and this continues not only in terminal and industrial areas, but in some of the most sparsely populated areas of the country as well. However, there are still shortages in practically all categories of maintenance labor, including a serious shortage in foremen on some roads. As of October 31, last, according to the records, the Class I roads of the country reported needs for 14,385 sectionmen and 13,541 extra-gang laborers, in spite of the approach of the winter season. This compares with their reported needs for 24,464 sectionmen and 9,464 extra-gang laborers on October 31, 1944, and for 18,292 sectionmen and 12,807 extra-gang laborers on July 31, 1945, in the midst of the last working season immediately prior to V-J Day.

Shortages by Regions

As of October 31, the largest requirements for track workers were in the Great Lakes region of the country, where total needs were reported at 7,730, and in the Southwest region, where total reported needs were 5,765. The next highest needs for track workers were reported in the Northwest section of the country, and in the Pacific Coast area, where needs were put at 4,475 and 4,081, respectively. The Northeast showed needs for 3,340 track workers, while the smallest number of unfilled orders for such workers was reported in the Southeast area, where such orders amounted to only 1,600.

While not strictly comparable, because of certain changes during the year in the geographical limits of the areas reporting, the total needs in the various regions as of October 31, 1944, were as follows: Southwest—7,938; Northwest and Great Lakes—each reporting 6,787; Northeast—4,541; Pacific Coast—4,371; and Southeast—3,500. Significantly, this comparison indicates a tighter track labor situation in the Great Lakes region than a year ago, and little or no improvement during the year in the Southeast and in the Pacific Coast area.

Skilled Workers Scarce

As for other classes of maintenance of way and structures employees, the needs reported by the Class I roads as of October 31, 1945, were 2,815 bridge and building carpenters and carpenter helpers; 766 bridge and building apprentices, helpers and laborers; 44 bridge and building mechanics and mechanics' help-



Locomotive shopman getting ready to move a pair of driving wheels

ers; 53 ironworkers and helpers; 243 bridge and building painters and helpers; 176 water service repairmen, mechanics and helpers—a total of 4,097. By comparison, the corresponding needs in these classifications as reported a year earlier were 1,370 bridge and building carpenters and carpenter helpers; 1,721 bridge and building apprentices, helpers and laborers; 187 bridge and building mechanics and mechanics' helpers; 165 ironworkers and helpers; 210 bridge and building painters and helpers; and 147 water service repairmen, mechanics and helpers—a total of 3,800.

The striking fact revealed in the foregoing is not only that, as a group, unfilled needs were nearly 300 greater toward the end of 1945 than they were toward the end of 1944, but that three months after V-J Day, shortages in bridge and building carpenters and carpenter helpers were nearly 1,450 larger than reported eight months prior to V-J Day.

Revealing as are the total figures as

to shortages in man-power needs among the maintenance forces, they are far less personal and impressive than the specific reports received by the *Railway Age* from roads in every section of the country, indicating little, if any, relief in their maintenance labor needs, commenting on the handicaps confronting present maintenance operations, and, in most cases, expressing considerable concern with the prospects for adequate labor in the first half of this year. In practically all cases where shortages are reported the least, or where improvement is shown in the situation over that which prevailed on V-J Day, the expressed or evident reason is primarily the closing down of the active working season on the track, with its smaller requirements for labor. On the other hand, one road with extensive mileage in the South, expressing the situation that prevails on other roads in this same general territory, reports that "We continue to be handicapped in all of our roadway programs because of insufficient forces."

And this situation is not confined alone to the areas of warmer climate in the country, as a number of roads in the North, looking forward to continuing their heavy program work in territories of generally open weather, have expressed equal concern about their ability to secure the necessary labor to permit this. One such road reported recently that it was still recruiting extragang labor for rail-laying work planned for the winter months, but that "Our success in recruiting the type of domestic labor required for this class of work is no easier now than it was last August, before hostilities ceased."

Little Improvement in West

In the Far West the situation appears to be more serious generally than in any other part of the country, it being reported from that area that "There has been no improvement in the maintenance of way labor situation since V-J Day; in fact, there appears to be a general letting down, and a tendency for those who can to take a rest." A report from one of the principal railroads serving that area is so revealing in this regard as to bear quotation in part:

"In spite of a very extensive advertising program, including radio broadcasts, for track and other classes of labor, it has not been possible to recruit domestic labor of any class to take care of our present shortage and the increasing shortage being created by the return of Mexican nationals to Mexico. Under this advertising program we have been able to hire in our track department since V-J Day only about 650 domestic workers, and during this same period many of those hired have not stayed in our employ more than a day or so, with a net result that we had a gain of only 274 men between August 20 and November 10, these comprising domestic Mexicans, whites, Japanese and Indians. At the present time there appears to be no immediate prospect of any domestic labor for the track forces.

"A similar situation exists in our bridge and building, water service and signal forces. In the gangs in these departments, helpers and mechanics receive considerably higher wages than ordinary labor, but, regardless of this fact, we have been unable to recruit bridge and building carpenters, water service mechanics, signalmen and signalmen helpers, with the result that within the period August 20 to date, we have been short a large number of men in these classifications and have been unable to augment them, even with a large recruiting program."

As to the effect of local influences on the ability to recruit maintenance labor, the situation is as confused as it was during the most critical period of the war. Some roads report the situation

easing in industrial and terminal areas, while others see little or no improvement in these areas. In farm areas where the producing season is still under way, and especially in Florida and some parts of the West, the competition of agriculture for workers has cut deeply into the normal pool of maintenance labor, indicating the continuing of a trend that portends serious difficulty for track labor during the coming growing season over the country generally unless reversed or at least halted. And one of the general territories of most serious shortage, present and during the war, is the sparsely settled mountain regions of the West—through Nevada, Arizona, Montana and similar areas, where the local population was never sufficient to supply the need for track labor, and for which labor has always had to be recruited from more populous areas in the East or along the Pacific Coast.

Return of Mexicans

Many factors combine to present this railway maintenance labor picture over the country as a whole. Of these, one of the most far-reaching, especially in certain sections, is the untimely return of the Mexican citizens that were brought into the country for railroad work as a war measure. At the peak of their employment, more than 68,500 Mexican employees were under contract on as many as 34 roads—in some cases representing the bulk of the track labor on these roads because of their inability to employ domestic labor, and almost without exception proving themselves indispensable to the war-time maintenance of the track structure.

As of August 20, less than a week after V-J Day—and disregarding all consideration of the needs of the railroads in the months immediately ahead—the recruitment of further Mexicans in Mexico was ordered stopped and a schedule of contract terminations and deportations was set up looking to having the last of these workers back over the border by the last of February, 1946. The pleas of many roads to the contrary, this program was put into effect and continues at the present time, modified only by the inability of the National Railways of Mexico to accept returnees to the border at the rate contemplated.

As of V-J Day there were approximately 63,400 Mexican employees under contract on the American roads. At the rate of deportation set up, it was contemplated that this number would be reduced to about 20,000 by December 1, but according to the record as of that date, there were still 45,400 Mexicans in the country, about half of whom continued to be held without contracts through expirations, because of the inability of the Mexican railways to handle them to points of contract origin.

In view of this situation, and the continuing needs of many of the American roads for track labor, the United States Department of Labor, through the United States Employment Service, has permitted the various roads employing Mexican citizens to continue in their employ, without contracts, but subject to all of the provisions of their contracts, such Mexicans as must await transportation into Mexico. Under this arrangement, to which many of the roads have agreed because of their pressing need for track labor, the roads must continue to provide housing and subsistence for the workers, even though they refuse to work following expiration or termination of their contracts, and even though they hire out temporarily to agencies other than the railroads, as some have done, awaiting scheduled transportation on the Mexican railways.

In fact, lack of a clear understanding of the reasons for delay in returning them, and of the considerations under which they are being retained in the country, without contracts, has caused considerable unrest, and even disorders, among some of the Mexicans, with a general uneasiness among many of the others, who, knowing that they must return to Mexico, have sought something more definite than the plans explained to them.

At the present time, the Mexican railways are accepting a total of approximately 20,900 a month. Of these, on a prearranged basis, from 13,000 to 15,000 are railroad workers, the remainder being Mexicans who were brought into the country under agricultural contracts, and who are likewise being returned to Mexico.

At this rate of return, the last of the railroad workers will be out of the country before the end of March.

Other Factors

Just how much the maintenance labor situation will change otherwise in the first half of the year is a matter for conjecture, and most of the conjecture at the present time is highly pessimistic. Factors other than the return of the Mexicans influencing this outlook are the slow rate with which veterans have returned to roadway and structures work, and the trend for many workers to seek employment at higher wages, of a less arduous nature, and in or near urban communities. Evident, too, is the lack of haste on the part of many war workers, now unemployed, to accept any job for the time being, some of whom expect unemployment pay by either the State or the Federal Government, and who do not wish to jeopardize this by going to work.

Just when the general situation will right itself no one knows. If it does not improve materially by the time most

of the roads of the country begin their heavy track maintenance programs in the spring, the plans of the maintenance forces for carrying out much needed work will be seriously jeopardized. In the meantime, many roads, with the co-operation of the Railroad Retirement Board, are planning to continue their recruitment programs unabated; are again looking to the employment of high school boys during their summer vacation period to the extent that state laws at the time will permit; are giving further consideration to improved housing facilities, both permanent and portable, for sectionmen and extra-gang laborers; are studying ways and means of transporting a larger number of the track forces to and from work so that they can live at their homes most or all of the time; and are considering every means of making track work less strenuous and more generally attractive through the more extensive use of power machines and tools to carry it out.

But the only effective solution of the track labor shortage in immediate prospect, as seen by at least some roads, is the continued recruitment of Mexican employees until the breaches in the ranks of the maintenance forces are closed by domestic labor.

Mechanical Labor Shortage

Although mechanical department labor conditions in general have improved slightly since termination of the war and apparently do not constitute any real problem on a few roads, there is still a considerable shortage of both skilled and unskilled labor at most railway shops, engine terminals and car repair yards with attendant more or less de-



Carman "trimming" the edges of a car journal brass before reapplying it for further service

ferred maintenance, lack of efficiency and increased unit costs owing to the attempt to get a large volume of work done with inadequate forces.

Figures compiled by the Railroad Retirement Board indicate a shortage for the month ending October 31 of 8,726 skilled trades journeymen, of whom about 6,300 are employed in the mechanical department. The greatest shortages in this category include, as shown in a table elsewhere in this article, 2,603 carmen, 1,715 machinists, 525 boiler-makers, 217 sheet-metal workers, 207 pipe fitters, 202 car inspectors, etc. Similarly, a total shortage of 6,669 skilled trades helpers and apprentices, roughly 3,900 of whom are in the mechanical department, is reported, including 1,004 carman helpers, 858 machinist helpers, 456 machinist apprentices, 337 carman apprentices, 246 boilermaker helpers, etc.

In the field of unskilled labor, a shortage of 4,558 shop laborers is noted, also 471 coach cleaners and 310 car cleaners. As in other branches of railway work, mechanical departments experience the greatest labor shortages in the San Francisco, Chicago and New York regions, respectively, with Kansas City, Mo., next; then Cleveland, Ohio; Denver, Colo., etc.

Equipment Programs Retarded

Car and locomotive maintenance programs were retarded on most roads during 1945 due to the inability to secure necessary skilled and unskilled labor. This condition was relieved to the fullest extent practicable by the adjustment of forces and the use of overtime. Helpers, where possible, were given intensive specialized training to qualify them for handling certain classes of work as machinists, boilermakers, blacksmiths and carmen. In general, this plan was fairly effective in getting work done, but at a definite sacrifice in efficiency, conservatively estimated at 20 per cent loss in production.

Apprentices also were advanced to handle mechanic's work, but the number of men thus promoted last year was relatively small owing to the fact that so many of them were inducted into military service. In fact, during the war period, most railways could not get anywhere near enough new apprentices to replace those entering military service and practically had to suspend apprentice training courses. The situation as regards college-trained special apprentices was even worse. For example, one large eastern carrier was able to retain only two of 97 special apprentices who were being trained for supervisory and other important special work on the railroad.

The use of women in classifications such as coach cleaners, laborers and helpers declined during the year on most

roads, one large western carrier reporting a decrease of about 40 per cent. Mexican labor forces continued to help in mechanical department work on quite a number of roads, but to a lesser extent during the year owing to the return of these men to Mexico as their contracts expired. The reduced use of women and Mexicans contributed to the shortage of unskilled labor in mechanical departments.

The practical effect of shortages of both skilled and unskilled labor was evident in the operation of shops and enginehouses. Locomotive arrivals were in many instances increased considerably and the urgent need for prompt return to service necessitated calling individual men or general repair gangs from adjacent back shops to help running repair forces make inspections and repairs at engine terminals.

Similarly, enginehouse machinists and mechanics were used as laborers at servicing pits, due to the necessity of making quicker turns of locomotives and the inability to employ common labor for this class of work. Obviously, the use of shop forces on running repair work affected the classified repair program on locomotives and enginehouse work was delayed by taking mechanics off their regular work. This fact and the use of men during overtime hours had its effect in increasing the cost of locomotive repairs.

The situation in the car department was similar with regard to labor shortages, resulting in the employment of inexperienced men, promotion of apprentices and helpers to mechanics and, due to their inexperience, often requiring two mechanics to work together with greatly-reduced efficiency. This also had its effect in car repair yards where it was necessary to call upon employees engaged in program car repair work to repair cars in transit and assist in holding the percentage of bad order cars to a minimum.

Prospects Not Encouraging

The prospects for the year 1946 are not encouraging, particularly with regard to the employment of common labor at rates of pay comparable with the class of work performed and, while it is true that the availability of individuals for employment has been increased to a certain extent by the return of men from the armed forces, many applicants for employment are reluctant to start their railroad careers as common laborers, or as apprentices. At one shop, for example, where a special study was made, individuals seeking employment were interviewed and approximately 55 men were contacted each week after V-J Day with the following results: 25 per cent refused employment because of being dissatisfied with wage payments;

40 per cent were not qualified under shop craft rules for employment as mechanics; 5 per cent were undecided; and only 30 per cent accepted employment.

Of those employed, 80 per cent worked as helpers, but, during the past three months 70 per cent of these men resigned after working 30 days or less. The reasons given for leaving the service were as follows: 55 per cent stated the work was too heavy and earnings not satisfactory; 22 per cent said the work was too dirty; 23 per cent said they had better-paying jobs to go to. Practically none of the men interviewed had previous railroad experience and this fact, together with the general practice of railroads in always training the majority of their mechanics and the difficulty in securing anything like an adequate number of apprentices during the last four years, confronts the railroads with a difficult problem in securing enough competent skilled and unskilled labor for the satisfactory performance of mechanical department work.

Another definitely discouraging factor in the latter part of 1945 was the low morale of employees at some railway shops and terminals where many shopmen declined to accept any responsibility and showed a decided lack of interest both in quality and quantity of work turned out. Possibly this was due to a general let-down on termination of the war, but, whatever the cause, it resulted in further limiting production. Absenteeism also was all too prevalent, possibly due to large earnings and accumulated savings as a result of emergency overtime work. Shop men seemed to feel that they could afford to spend some of their savings and exhibited a readiness to find excuses for laying off. In some cases, even supervisors seemed to be influenced by this feeling.

A somewhat more optimistic note is sounded by individual roads which report improving employment conditions in their particular territories owing to the return of men from the armed services and the release of machinists and other skilled craftsmen from nearby war production plants and government arsenals.

One railroad mechanical officer reports that shortages of material have proven even a greater drawback than shortages of man-power. Another refers to the employment of a considerable number of men over 70 years of age in lower-bracketed jobs and says that in many instances it is surprising and enlightening to observe the excellent work being done by these men who have generally been put in the discard. This officer also gives specific credit to the Railroad Retirement Board and the United States Employment Service for untiring efforts and valuable assistance in helping railroads through a critical period of labor shortage.



Designed for day and night comfort—Individual radio speakers are built in the face rests of the reclining seats

More Passenger Trains Ahead

THE much-discussed postwar rehabilitation of railway passenger service is rapidly gaining momentum. The first stirrings of renewed interest in the purchase of passenger-train cars which manifested themselves in the spring of 1944 have since gradually extended and accelerated until there is now no question as to the nation-wide character of the movement. By the end of 1944 orders had accumulated for about 500 cars. At the end of 1945 the number had risen to approximately 1,700. Furthermore, since December 1 inquiries for nearly 1,300 cars have been announced. Significant of a major change in future relationships within the passenger-transportation field, with the prospective disappearance of the Pullman Company from the scene, is the inquiry of the Chesapeake & Ohio for 1,000 sleeping cars.

A part of the passenger-car orders accumulated during 1945 represent the beginnings of modernization on some railroads by the purchase of rolling stock for a new train or two. Others

By C. B. PECK
Mechanical Department Editor

represent programs for a complete rehabilitation of all important main-line passenger service. Some of these orders, notably that recently placed by the New York Central, represent programs the fulfillment of which will extend over at least the next two years. The outlook for an increased volume of such orders during 1946 is bright.

Orders for sleeping cars were placed by at least four railroads during 1945. With the date set for the demise of the Pullman Company and no certainty as to the proprietorship of railway sleeping-car service in 1946, the railways had no recourse but to place orders for sleeping cars on their own account in their plans for re-equipping passenger trains during 1946. These cars will include the modern interior arrangements already incorporated in recently built Pullman cars and other completely new

types of facilities which have been worked out by the car builders. These include various schemes to provide low-cost service by increasing the number of persons who can be accommodated per car. It seems certain that open-section sleeping cars will fast disappear from the more heavily traveled routes during the next few years to be replaced with a bewildering number of types of group and individual accommodations.

1946 Characteristics

Little need be left to the imagination in visualizing what the passenger-train cars to be turned out by the builders in 1946 are going to be like. Their prototypes are already in service—some of them for 10 years. With few exceptions, car bodies will be of lightweight construction in which either the low-alloy high-strength steels, stainless steel, or strong aluminum alloys will be utilized. The low-alloy steels have been used in two forms of construction: all-welded plate-girder car bodies and weld-

ed truss frames enclosed with stainless-steel sheathing. In cars in the structures of which stainless steel is utilized practically to the exclusion of other materials, the bodies are of truss construction, fabricated by controlled-energy spot welding, enclosed with fluted stainless-steel sheathing. Aluminum-alloy car bodies are of girder construction, fabricated by riveting. All of these materials and types of construction are in successful use.

Reductions in weight from the conventional heavy passenger-car structures up to one-third have been effected by these types of construction. Attention is now being given to the possibilities of further reductions by lightening various items of installed equipment such as seats, the water-supply system, electrical power system, and brakes. Reductions in truck weight are also being effected by reductions in the wheel bases of four-wheel trucks and by the use of stronger steels in the truck castings.

Further Progress Assured

At least four features of passenger-car equipment play an especially important part in the comfort of the passengers in railway cars. These are the trucks, the connections between cars, the car seats, and the air-conditioning. The trucks are largely responsible for the smoothness and comfort of the ride and they have been the subject of much study and development ever since the movement for lighter and faster trains began. Further progress is already certain.

The connections between cars include couplers, draft gears and diaphragms. They affect the smoothness of train performance in starting and stopping and have been a source of annoying noise while the train is in motion. Tight-lock couplers and rubber draft gear have effected improvement in end shocks and improvements in the suspension of diaphragms have reduced the noise.

With reasonable smoothness in the riding qualities of the car established, the quality of the seating is the next most important factor in assuring pas-

A renewal of passenger-car buying began in 1944. Orders accumulated at the end of that year amounted to 500 cars. Last year ended with 1,700 cars on order and inquiries for nearly as many more—a bright outlook for 1946. Lightweight construction, employing low-alloy, high-strength steels, stainless steel and strong alloys of aluminum was introduced about 10 years ago. Improvements in trucks, couplers and draft gears, seats, and a host of other comfort and style factors all will contribute to the attractiveness of railway travel.

senger satisfaction. One manufacturer of car seats, cooperating with the Car Construction Committee of the Mechanical Division, had recourse to the scientific method by engaging the services of an anthropologist of established reputation to ascertain statistically the facts essential to fitting the coach seat to the average human frame. Many a traveler, whose attempts to fit himself to the dimensions of seat types still widely prevalent has ended in despair, will rejoice at this new respect for the anatomical quirks of the human body.

Many comfortable seats are already in service—comfortable alike for day and night occupancy.

From Pearl Harbor to the end of 1944 about 900 railway passenger-carrying cars were added to the air-conditioned list; there were no further additions during the past year. That fact, however, does not indicate that a saturation point in cars available for air conditioning has been reached. Of the approximately 20,400 passenger-carrying cars of railway ownership only 40 per cent are air conditioned. Eliminating some 7,000 to 8,000 passenger-carrying cars which are believed to be engaged in suburban service, air-conditioned cars represent but little more than 60 per cent of the re-

mainder which are engaged in longer distance service. Furthermore, only about the same proportion of the 8,000 Pullman sleeping cars are air conditioned. No doubt these coaches and sleeping cars alike produce considerably more than 60 per cent of the passenger-miles. But a much larger percentage of the inventory will have to be air conditioned before a satisfactory degree of public approval is attained. This situation will be remedied as the new rolling stock now on order, and to be ordered, is delivered.

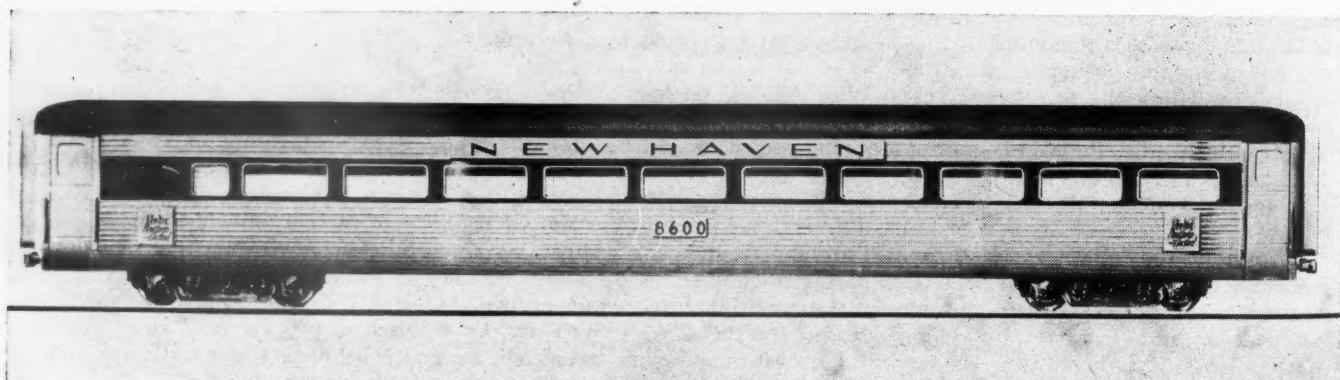
Coach Comforts

Numerous other features of the passenger cars of 1946 will come in for special attention. Among these are ample toilet, dressing and lounge facilities for coach passengers, particularly for passengers in overnight trains.

Then there is the whole field of styling which is nonetheless important because its course is relatively unpredictable. Included in it are all the uses of color, both outside and inside the car, and involving wall and ceiling surfaces, drapes, upholstery and floor coverings. There are all the varied treatments of lighting, including some original ideas concerning the introduction and distribution of daylight in the car; there are the many variations in the texture of interior surface finishes and as many varieties of ornamental treatment; there are new forms and arrangements of lounge and dressing-room facilities.

In total, these factors are a barometer of the spirit of the industry. Frequent changes designed favorably to effect comfort and those in the realm of taste which reflect a willingness to try new effects all convey a subtle impression of alertness and competency which is contagious. On the contrary, to become careless concerning "style"—to allow present "styles" to become standardized—will, with like subtlety, rebuild the unenviable reputation of unprogressiveness. Having adopted a course of style consciousness, there is no place to go but on.

Exterior of the 100 new coaches to be purchased by the New Haven—Other types will bring the proposed purchase up to 180 cars



Work Equipment Has Biggest Year

Faced by shortages in labor, the railways have been compelled to go the limit in the mechanization of their gangs to insure upkeep of their structures

By GEORGE E. BOYD

Associate Editor

IT is a far cry from the situation that confronted maintenance-of-way officers at the close of World War I to that which is facing them now at the close of World War II. Now, as then, the same scarcity of labor is arousing fear that the over-used and under-maintained track and structures will deteriorate still further unless the forces now in service can be augmented. But now, in contrast to then, maintenance officers have on hand and in prospect a wide range of power tools and machines to help them over the hump.

Now, as in the former period, there is an evident reluctance on the part of many men released from military service to return to their old jobs, and widespread refusal on the part of those released from war plants to take or to return to jobs that pay less money than they received in inflated wages for war work. In the face of this situation a quarter century ago, maintenance officers were compelled to rely on the none-too-plentiful supply of manual labor they were able to obtain, for there were practically no portable power tools available to boost the output of the inadequate forces at their command. Such power equipment as was then in use, except motor cars, and their use was by no means universal, consisted principally of large units, such as spreaders, pile drivers, locomotive cranes and large on-track ditching machines. Furthermore, only a limited number of roads possessed equipment of these types, and probably no road had units of all of the few types then available.

Since then, there has been astonishing development in the character and distribution of both power machines and power-actuated hand tools, including an equally astonishing expansion in the number of types available to maintenance officers to perform a wide variety of tasks. In strong contrast with the paucity of types available at the close of the first World War, maintenance officers are now able to make selection from more than 200 types, many of which are offered in several designs.

With only slight improvement since the close of the war with Japan in August, conditions with respect to maintenance-of-way labor have grown steadily and consistently worse since the early part of 1942, on top of which the rail-

ways have carried the heaviest burden of traffic in their history. The inevitable result has been an almost continuous accumulation of deferred maintenance, until today deferred maintenance in many parts of the fixed properties is greater in volume than it was at the close of the depression years.

While inability to obtain needed materials has been a factor in the accumulation of deferred maintenance, this has been secondary to the shortage of labor, which has increased the effect of the material shortage to a degree scarcely realized by those not in immediate touch with the situation. If maintenance officers were compelled now to rely almost entirely on manual labor, as they were in the period immediately following World War I, in the face of the existing labor shortage the effect of such a situation would be little less than disastrous. Fortunately, however, they are able through the mechanization of their

It is not debatable that, despite the most acute shortage of labor that has prevailed in recent years, the railways have been able to maintain their tracks and structures in condition to carry the largest traffic in their history only because they have relied to the maximum extent on the mechanization of those forces they have been able to obtain. However, deferred maintenance has accumulated to an extent that will require several years of intensive effort to overcome, so that reliance on power machines and power tools must continue, regardless of possible improvements in the labor situation. This means that the demand for work equipment will continue on about the same scale as in recent years.

forces so to increase the output of the inadequate forces that are available to them that even an approach to disaster has been avoided. Despite this, the large volume of work that has accumulated during the four hectic years since the shortage of labor began early in 1942 is a matter of real concern to them as the labor situation continues little improved in many areas.

Confronted with an increasing amount of work to be done and a relative decrease in the number of men with which to do it, maintenance officers, by force of circumstances, were compelled to mechanize their forces as the only alternative to allowing the track and structures to deteriorate to the point where war traffic would be impeded and the war effort affected adversely. This was not a particularly difficult decision on their part, however, for they had learned by bitter experience during the depression years immediately preceding the war activity that, while there is no complete substitute for man-power, power machines and power tools can be used to excellent advantage to increase the output of the individual or the gang, without increased manual effort.

Needs Were Expanded

Although maintenance officers were already aware, therefore, of the benefits to be derived from the use of work equipment when labor was scarce, and although they had been buying freely, measured by previous standards, since 1937, there is no evidence that at the start of the war any one of them had the slightest conception of the extent to which they would be compelled to rely on this equipment in the years immediately ahead. Almost without exception, therefore, when the labor shortage did occur, the railways found themselves inadequately equipped with power machines and power tools, both as to the number and types needed, to meet the situation.

As a result, budget requests for power machines and tools that had been prepared for 1942 were increased materially, and 7,612 units of 156 types were purchased that year. This was enlarged to include 8,507 units for 1943 and to 9,984 in 1944. Yet, despite these largely expanded purchases, the amount of

equipment in service still failed to keep pace with the needs of maintenance, as the labor situation continued to become more and more acute.

In the light of their previous experience, the work equipment budgets at the beginning of 1945 carried authorizations for the purchase of about 10,000 units, but these were later translated into orders for 12,000 units at a cost of \$17,500,000. This brought the total purchases for the years 1941 to 1945, inclusive, to approximately 36,000 units, at an overall cost of more than \$65,000,000, and raised the total investment in work equipment to approximately \$135,000,000.

Saturation Not Near

One of the most-frequently expressed fears of manufacturers of work equipment has been that, because of the rate at which such equipment has been acquired in recent years, not a few types would reach the point of saturation and that sales would then drop off to the point where manufacture would no

longer be profitable. This possibility is refuted by the continued large purchases of motor cars, which have not only been employed longer than any other type, except locomotive cranes and pile drivers, but which are more nearly in universal use than any other type of equipment. If the saturation theory is correct, sales of motor cars should have dropped off years ago, yet purchases still continue at a high level today.

What most of those who possess this pessimistic outlook have overlooked is that under the conditions of use to which power machines and tools are subjected, the life of almost all types is short, compared with locomotives, cars, machine tools and other types of railway equipment. For this reason, the larger the acquisition of various units of work equipment, the larger will be the market for replacements as the original machines wear out.

It is almost axiomatic that we have arrived at an era of mechanization, and that the railways cannot, even if they desire to do so, revert to manual meth-

ods in their maintenance operations. In other words, all indications point to a continuation of a large-scale demand for a wide variety of power machines and power tools.

An excellent example of the expanding use of power equipment in maintenance is that demonstrated by tie tampers, which were among the early types of work equipment developed. In the early years of their development, however, they were accepted slowly, for they were designed primarily for use by large ballasting gangs, and the outfits were heavy, cumbersome and difficult to handle, besides which, the cost of such outfits was high enough to cause more than one maintenance officer to hesitate to recommend their purchase.

However, these tools were so effective in the work they were designed to do that there arose shortly a demand for lighter units to serve smaller gangs, and eventually for equipment that could be assigned to section gangs. As these demands were met, there was a large expansion in the use of mechanical tamp-



Modern earthmoving equipment for grading, ditching, cut widening and general drainage operations has done much to offset the manpower shortage since the beginning of the war

ing equipment, which is still under way and is likely to continue for some years to come.

Ballast Still in Arrears

For 16 years ballast applications have been in arrears annually, in some years by more than 50 per cent. Also, as a result of the intensive traffic of the last five years, ballast has worn out and become fouled at an unprecedented rate. For this reason, in their efforts to apply the maximum ballast possible, despite the shortage of labor, the railways have been buying tie-tamping equipment freely during the last five years, and the budgets that have been completed for 1946 contain a large amount of this equipment. As a further means of overcoming the handicap imposed by continued deficiencies in new ballast, during the war years the railways purchased an unprecedented amount of ballast-cleaning equipment, so that more ballast was cleaned during each of these years than in any previous year. Since it will take a long time to overcome the deficiency that has accrued in the application of ballast and since the practice of cleaning ballast has become firmly established, it is safe to predict a continuation of the practice on a large scale, with its incidental demand for equipment designed for this class of work.

So many problems connected with deferred maintenance, which have resulted from conditions imposed by shortages of both materials and labor during the period of the war, are facing maintenance officers that only a few of them can be mentioned. Among the most prominent of these is that of rail. Starting with a marked deficiency in 1941, this has increased year by year until there is at present a greater amount of worn rail in the tracks than ever before.

Rail Gives Concern

Present plans of the railways as a whole contemplate the replacement of this worn rail at a rate reminiscent of the late twenties, but even at this rate it will require a number of years before the present deficiency can be overcome, after which large rail programs will still be necessary to get ahead and build a desirable amount of reserve into the track. This situation foreshadows a continuing large-scale demand for rail-laying units, which have become a necessity for handling and installing the large rail sections of today.

Gaining acceptance somewhat slowly at first, partly because of the restricted funds available for maintenance during the trying decade of the thirties, a wide variety of small portable power machines and power tools for use by small gangs, or by small units of large gangs, is now



Power tie tamping equipment is recognized as an indispensable aid to the track forces

available for an equally wide range of work. So popular have these machines become that a steady demand for them has developed during the last five years that bids fair to continue at or above its present level. These include such widely divergent types as grinders, drills, borers, timber and rail saws, power and impact wrenches, bolt tighteners (for track bolts), tie borers, portable weed burners, paint and creosote sprayers and other types of tools, that are offsetting shortages in labor to an extent that would have astonished maintenance officers two decades ago.

Along with the increased demand for these smaller tools for hand use, there has been another equally marked development that has by no means reached its peak. This is the continued demand for large units, such as locomotive and other types of cranes, power shovels, draglines and other earth-moving equipment, powered by both gasoline and Diesel engines, and for still other units such as spreaders and pile drivers. This was especially noticeable in the purchases made in 1945, and there are many indications that the trend will carry over into 1946.

Demand for Machines

Any study of work equipment and its development will disclose an amazing story of its expansion and of an increasing demand for the creation of machines to perform tasks that were still being performed manually. It is somewhat surprising, therefore, in the face of this almost continuous expansion, which was interrupted only twice during the depression years, that many of the

machines that are in wide use today were accepted so slowly in the beginning that in some cases their introduction almost ended in failure.

It is a remarkable commentary on the forward-looking ability of a relatively few maintenance officers, and on the optimistic belief in their equipment by manufacturers, that many of these machines survived and that work equipment in all of its wide variety has assumed the position it now holds as a prime necessity in maintenance, and which it bids fair to maintain in the future.

It is of more than passing interest that in the nine-year period from 1937 to 1945, inclusive, which includes the years of greatest expansion in the use of work equipment, the railways purchased 59,757 units. Yet despite these large purchases, which include every type and design available, there is still a real shortage upon practically every road. While this statement can be substantiated in several ways, the simplest and most convincing is that while most roads have not completed their budgets for 1946, enough of them have done so to indicate quite clearly that, large and astonishing as the purchases for recent years have been, and despite the record-breaking purchases for 1945, those in the year ahead will be still larger. Heretofore, most of the purchases have been made as additions to the equipment already in service. Such additions are certain to continue, but the machines already on hand have been used so intensively in recent years that there is already evidence of a demand for more and more units for replacement purposes, a demand that is certain to continue indefinitely.



The primary problem will be to maintain the properties to high standards while keeping control over costs

WITH another year of intense activity behind them, the maintenance man and the engineer have seldom been confronted with a more challenging picture as they contemplate the problems of the year that lies ahead—a year in which the problems of peace will be crowding hard on the heels of a lingering residue of war-time factors. In some respects, at least during the early months of the period, the situation will be strongly reminiscent of the war years, with continuing shortages of labor and certain materials. These, however, are transient problems that are almost certain to disappear in the not too distant future, leaving as the primary problem that of building up and maintaining the prop-

erties to the high standards that will be required by competitive factors in the transport field, while at the same time keeping costs under careful control.

Turning first to a review of the activities of the maintenance of way and structures departments during 1945, the most significant development is that—for the third consecutive year—the total expenditures by these departments again attained a new all-time high. With the official figures for the first nine months as a basis, it is estimated that the total expenditures of the Class I railways for maintenance of way and structures for the entire year will amount to approximately \$1,360,000,000. As an index of activity this figure is distorted somewhat

Outlay for

by a number of factors that will be discussed later. Taking it first at its face value, however, it is \$96,708,000, or 7.7 per cent, higher than the comparable expenditures for 1944, and is \$251,719,000, or nearly 23 per cent, above the figure for 1943. Indicative of the extent to which maintenance activities have been expanded since the depression years is the fact that the 1945 expenditures were nearly four and one-quarter times those of 1933, the low point of the "thirties." Possibly even more striking is the fact that they were nearly one and two-thirds times the average annual expenditures for the period 1925-29, inclusive.

A table shows the annual expenditures for maintenance of way and structures of the Class I railroads for the 11 years ending with 1944, the latest year for which official figures are available, as well as the average annual expenditures for the period 1925-29. Included also in the table are figures showing the manner in which the total for each year was distributed among the various primary accounts.

Unusual Charges

In using the estimated total expenditures for 1945 as a measure of relative activity, allowance should be made for the fact that they not only show the influence of the various abnormal factors that have affected the totals for several years in the past, but that, as a result of the end of the war, one of these factors was present in an enlarged degree during the closing months of the year. This factor was in the form of charges to maintenance of way and structures expenses in connection with the amortization of defense projects. The roads had been making such charges since 1942 on the basis of a 60-month amortization period, but when the war ended they were given permission to charge off the entire unamortized amounts during the remaining months of 1945.

The increased effect of the greater charges for amortization was first noticeable in September, when the total expenses for maintenance of way and structures of the Class I roads included an item of \$22,209,031 for this purpose, as compared with \$1,761,259 in September, 1944. In a recent issue of its Monthly Comment on Transportation Statistics the Interstate Commerce Com-

Upkeep Goes Still Higher

By **MERWIN H. DICK**

Western Engineering Editor

mission stated that the unamortized balance of defense projects in the form of roadway property was estimated to be \$47,000,000 as of October 1, and that indications were that the great majority of Class I railroads would take advantage of permission to charge operating expenses with the entire amounts of their individual balances during the remainder of the year. This assumption, therefore, was taken into consideration in estimating, for the purpose of this article, the total charges to maintenance of way and structures expenses for the year; that is, the charges for amortization are included in the estimated total.

As in 1943 and 1944, the total expenditures for 1945 also include substantially higher charges for depreciation of roadway property than had been the practice in prior years. For instance, in 1944, the latest for which figures are available, the total expenditures included depreciation charges of \$108,389,704, which compared with similar charges of only \$40,766,091 in 1942, the last year before the roads were required by the I. C. C. to set up mandatory systems of depreciation accounting for certain roadway property.

Other Inflationary Factors

Not only were the total maintenance expenses in 1945 artificially inflated by the greater charges for amortization and depreciation, but the actual expenditures for this purpose continued to be affected by the various influences that have tended during the war years to reduce the effectiveness of the maintenance dollar, thereby requiring that more dollars be used to accomplish the same amount of work. Among these was the widespread practice of doing a large amount of work at over-time rates of pay; the continued necessity of using inefficient or inexperienced labor to a large extent; the generally increased costs of materials; and the greater loss

of productive time due to the higher density of traffic.

Hence, in making comparisons with previous years, it is apparent that the amount of work accomplished by the maintenance forces in 1945 was somewhat less than would be indicated by the magnitude of the dollar value of the expenditures for such work. The probability is that, with traffic remaining at record levels during the greater part

Last year the Class I railways spent an estimated \$1,360,000,000 in maintaining and repairing their fixed properties. This expenditure was the highest on record, but it incorporates the effects of a number of inflationary factors that must be taken into consideration in any attempt to translate it into terms of relative activity. These factors are discussed in this article, along with other aspects of the work of the maintenance and construction forces in 1945, and the prospects for such work in 1946.

of the year, the amount of maintenance work performed, on the whole, was no more than sufficient to compensate for



Among the improvement projects completed in 1945 was this bridge across the Missouri River at Kansas City, built jointly by the Chicago, Milwaukee, St. Paul & Pacific and the Chicago, Rock Island & Pacific

Expenditures for Maintenance of Way and Structures, Class I Railways

(Thousands)

	Average 1925-1929 (Inclusive)	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
Superintendence	\$57,262	\$33,347	\$35,605	\$37,357	\$39,801	\$38,935	\$39,072	\$40,231	\$43,407	\$49,461	\$57,592	\$63,790
Roadway Maintenance	83,698	30,714	35,809	38,289	42,017	37,219	36,112	38,372	47,923	69,701	110,764	121,072
Tunnels	2,608	1,051	1,453	1,326	1,709	1,256	1,210	1,374	1,780	4,529	3,668	4,222
Bridges, Culverts, etc.	43,471	20,139	22,646	24,032	26,268	24,200	24,782	26,514	31,754	40,801	44,356	51,227
Ties	114,859	50,748	51,936	56,315	59,799	53,762	59,910	58,353	64,928	75,141	84,982	100,446
Rails	47,402	15,418	16,302	21,192	20,412	17,406	22,065	22,736	24,684	25,199	33,146	39,544
Other Track Materials	48,354	18,694	20,959	26,732	30,228	22,817	29,670	33,428	38,711	40,091	50,541	57,220
Ballast	19,379	7,538	8,357	11,992	12,362	7,744	10,343	11,592	15,093	20,107	25,168	28,493
Track Laying and Surfacing ..	211,067	85,641	94,033	106,072	121,113	103,420	114,932	117,839	156,142	212,594	289,636	366,999
Fences and Snow Sheds	5,831	2,412	2,260	13,397	13,689	12,939	13,235	3,408	3,930	4,031	15,877	18,121
Crossings and Signs	13,115	7,293	7,186									
Buildings	79,000	31,448	33,047	41,252	47,757	34,315	41,018	46,852	60,412	80,663	102,680	114,513
Water Supply	10,444	4,441	4,497	5,860	6,182	4,672	5,207	6,020	6,736	8,561	9,680	11,473
Tools and Equipment	18,230	10,666	11,044	13,452	15,408	11,456	13,720	15,434	18,971	20,892	23,397	28,664
Injuries	5,907	2,810	2,727	3,118	3,303	2,806	2,929	3,220	3,547	4,642	5,903	6,856
Removing Snow, Ice and Sand ..	9,947	5,630	7,001	13,365	6,655	5,239	6,110	9,030	5,995	8,739	12,798	14,882
Miscellaneous	78,449	37,310	39,105	51,059	58,891	51,961	56,516	29,202	79,076	131,206	248,093	245,770
	\$849,021	\$365,300	\$393,967	\$454,810	\$495,594	\$420,147	\$466,831	\$497,031	\$603,088	\$796,358	\$1,108,281	\$1,263,092

Note: Miscellaneous includes such items as signals and interlocking, depreciation, deferred maintenance, amortization and unclassified charges.

* Not shown separately since 1935.

† Includes signs, as well as fences and snow sheds.

More intensive mechanization of work gangs is in prospect as a means of promoting efficiency

current wear and tear, with little or no progress being registered in making up the ground lost during the earlier war years.

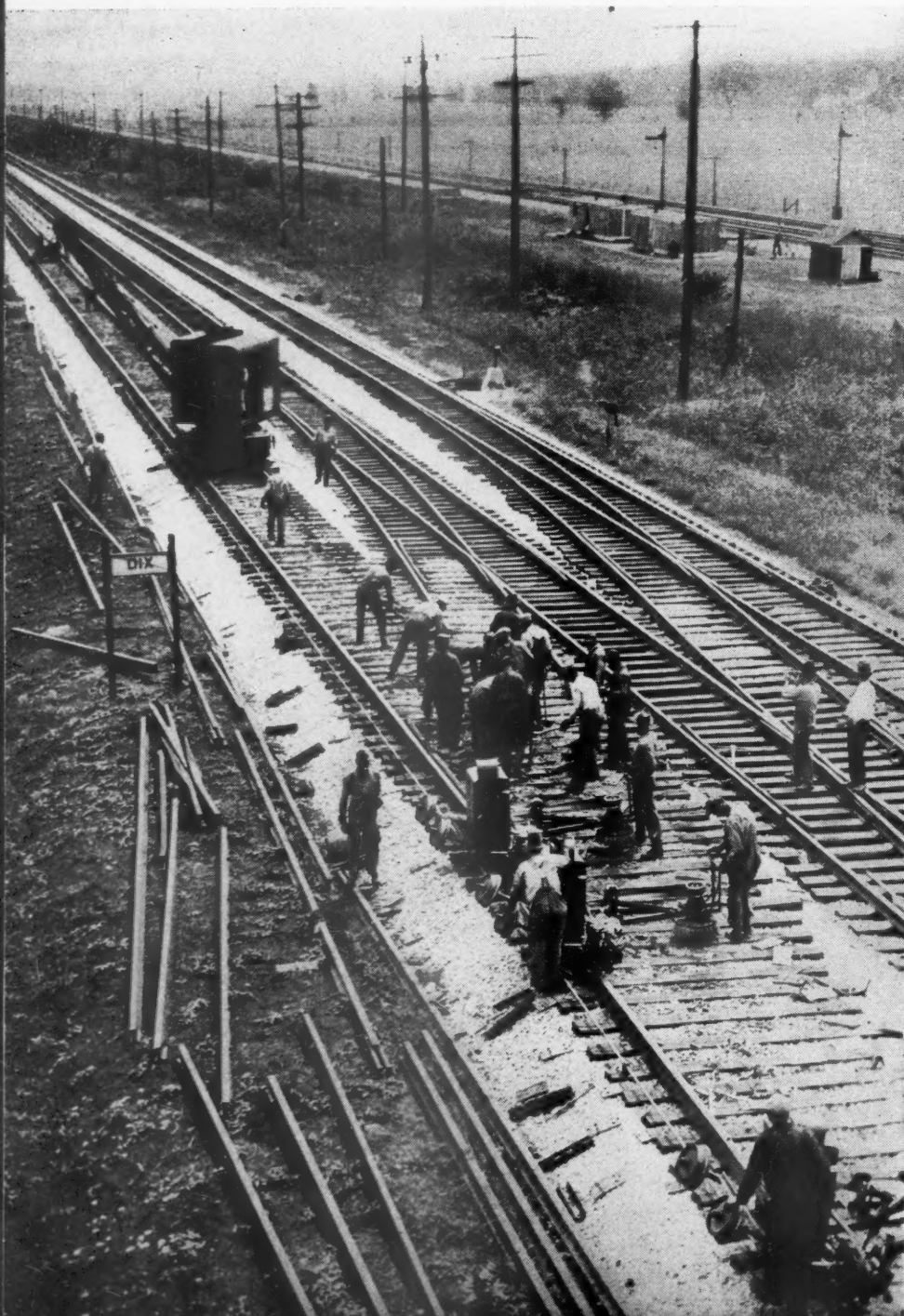
Among the more important elements of the railroad plant that suffered a decline during recent years, including 1945, was rail, for at no time since the war started have the railroads obtained as much rail as they estimated would be required to meet their minimum needs. For the two years, 1942 and 1943, the total quantity of rail received was nearly a million tons short of the minimum requirements. In 1944, in the face of estimated requirements of 2,600,000 net tons of rails, the roads received only 1,874,000 tons. Nor did they fare any better in 1945. Although it was estimated that they would require at least 2,900,000 net tons of rails in that year, they actually received only about 1,875,000 tons, or practically the same as in 1944.

Rail Still a Problem

A table shows the number of gross tons of new rails applied in renewals by the Class I railroads for each year since 1925. For 1945 the amount shown is 1,622,000 gross tons (1,816,640 net tons), which is based on figures supplied to *Railway Age* by practically all Class I railroads, giving the tonnage of new rail installed by each of them for renewal purposes during the year. This is an impressive figure in that it represents the largest amount of rail that the roads have laid during any year since 1929, when they laid 1,958,489 gross tons (2,190,000 net tons). However, on the basis of the tonnage laid per unit of traffic carried, the rate of rail renewals in 1945 was only slightly more than one-half that of 1929, and showed very little improvement over the worst years of the depression.

What About 1946?

In view of the inability of the railroads as a whole during recent years to obtain new rail in sufficient quantities to compensate for the rate at which rail in



Repair shops and servicing facilities will have to be provided for the Diesel-electric locomotives that are coming into use on an increasing scale

track was being worn out, it was natural that they should be entertaining the hope that immediately after the close of the war it would be possible for them to start improving the condition of their rail by acquiring substantially larger tonnages of new rail. To this end many roads had made plans to purchase considerably more rail for laying in 1946 than they had been able to obtain in recent years, but present indications are that the roads as a whole will be unable to obtain the quantities of rail required to implement their plans in this respect.

The situation seems to be that, with war-time controls eliminated, the demand for steel from all consumers is expected to be such that the mills will be unable to satisfy all of them in full, thereby requiring that some voluntary system of rationing on the part of the mills be used to allocate the available supply. On this basis, indications at present are that, barring unforeseen developments, the tonnage of new rails to be made available in 1946 will be no greater than that obtained by the railroads in 1945. Another phase of this same picture is that, while the railroads will be able to acquire the necessary fastenings for their new rail next year, it will be difficult for them to secure the additional fastenings required for routine maintenance. In fact, it is rumored that one large steel company is planning to abandon the manufacture of cut spikes altogether. Still other factors which may influence the quantity of rail and fastenings produced by the mills in 1946 will be the labor situation in the steel industry, and the relative prices that the mills can get for their products, it having been indicated in some quarters that, with rail and fastenings on a



relatively low price level, there is little incentive for the steel companies to emphasize the production of these items.

Tie Renewals Dip

The crosstie situation continued to be a source of considerable concern in 1945. One of the tables gives the number of crossties that the Class I railroads have inserted in renewals in each year since 1925, the figure for 1945 being an estimate based on figures supplied to *Railway Age* by the Class I roads. From this table it is apparent that tie renewals for 1945, amounting to approximately 44,770,000 ties, were less by 3,263,000 ties, or 6.8 per cent, than the number of insertions in 1944. They were, moreover, less than for any year since 1940.

Broadly speaking, it is apparent that the roads as a group fell considerably short of acquiring as many ties in 1945 as were needed to carry out necessary renewals, although some lines fared better than others. Even where the full requirements were obtained, late deliveries made it impossible on some roads

to insert all the ties received during the year. On still other roads a lack of sufficient labor prevented the installation of even the limited supplies of ties received.

Present indications are that, as with rail, the supply of crossties will continue to be limited in 1946. The production of ties continued at a low ebb during the first seven months of 1945, after which, following adjustment of the price ceiling structure, effective July 26, there was some increase in activity, although many adverse factors remained that tended to prevent more than a moderate increase in output. What the situation adds up to is that the railroads can expect to make little, if any, progress during 1946 in restoring the deferred maintenance in the condition of their ties that has accumulated during the war years.

Looking Ahead

Considering maintenance of way and structures activities as a whole, what is likely to be the trend in 1946? In approaching this subject it must be kept in mind that many railroads are not only confronted with the problem of making up for the decline in the physical condition of their properties that occurred under the stress of war-time use and shortages, but that they are also faced with the necessity, in many instances, of raising the construction and maintenance of their tracks in high-speed territories to new high standards. The progress that will be made in this direction in 1946 will, of course, depend on many factors, including the availability of the necessary man-power and materials. At the present time the over-all situation in this respect is characterized by so many uncertainties, such as those affecting the availability of rails and ties, that accurate analysis is not possible. Doubtless, some classes of work will, for the time being at least, continue to be

Rail Applied in Renewals—Class I Roads

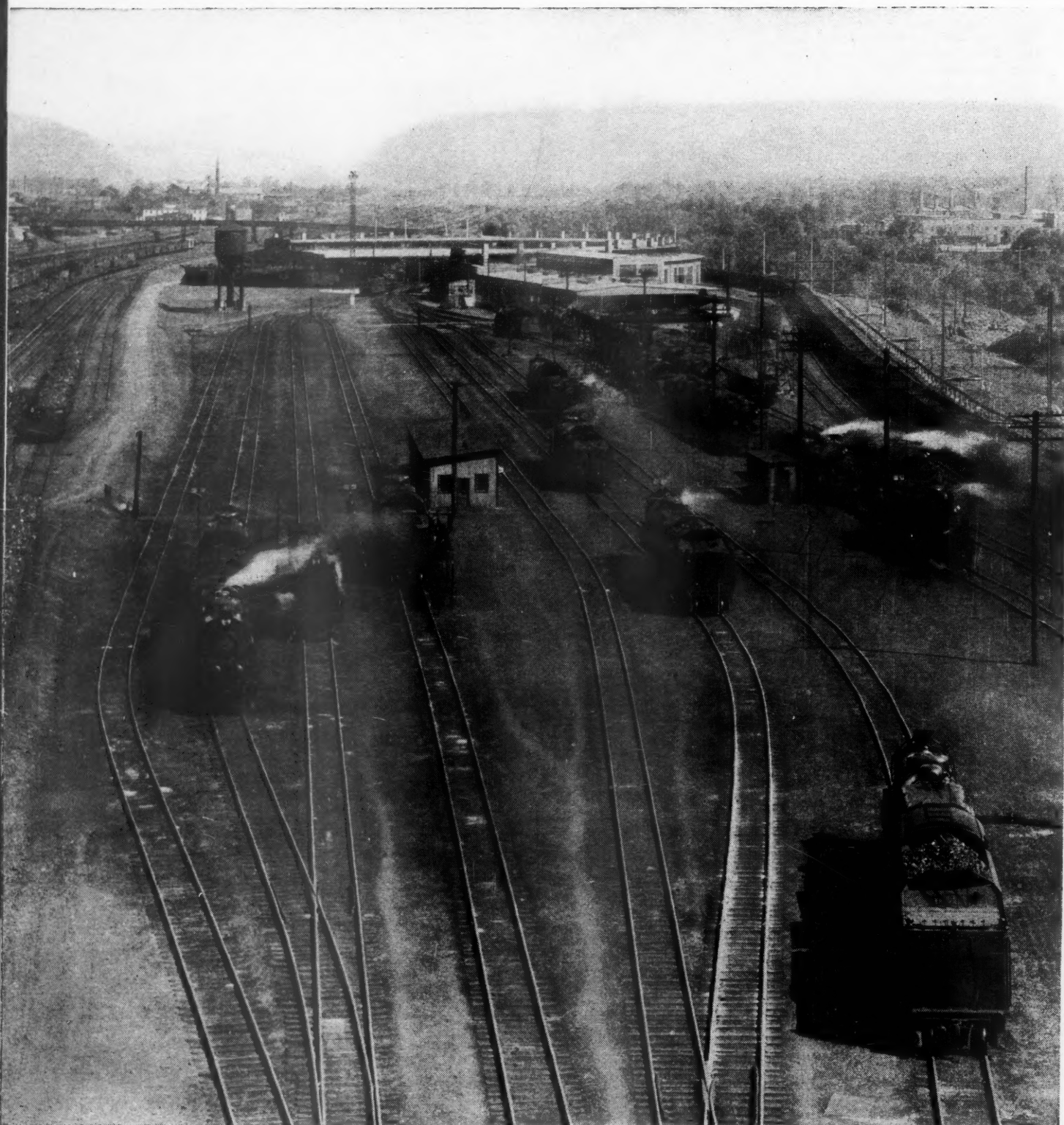
	Gross Tons		Gross Tons
1925	1,950,146	1935	582,794
1926	2,209,873	1936	921,298
1927	2,124,765	1937	1,029,861
1928	2,080,277	1938	599,752
1929	1,958,489	1939	878,643
1930	1,517,002	1940	998,914
1931	984,900	1941	1,197,593
1932	394,536	1942	1,192,225
1933	403,254	1943	1,262,547
1934	631,093	1944	1,561,638
		1945	1,622,000*

* Estimated

Crossties Applied in Renewals—Class I Roads

	Gross Tons		Gross Tons
1925	82,716,674	1935	44,351,900
1926	80,745,509	1936	47,361,015
1927	78,340,182	1937	47,729,538
1928	77,370,491	1938	41,363,224
1929	74,679,375	1939	45,088,278
1930	63,353,828	1940	43,620,653
1931	51,501,659	1941	47,224,593
1932	39,190,473	1942	48,616,228
1933	37,295,716	1943	45,439,512
1934	43,306,205	1944	48,032,634
		1945	44,770,000*

* Estimated



The modernization of engine terminals is a class of work that will claim attention in 1946

retarded by shortages of men and materials, although it is logical to expect that the situation will improve gradually with the passage of time. A reasonable expectation is that total activity in the maintenance of way and structures field in 1946 will not vary greatly from the level that prevailed in 1945.

Any discussion of future prospects in the maintenance field would not be com-

plete without reference to the problem of costs. Circumstances are certain to demand that every possible measure be taken to improve the efficiency of the maintenance forces. At the top of the list in this respect is the necessity for eliminating, as rapidly as possible and to the extent practicable, all those factors, born of war-time conditions, that have tended to reduce the efficiency of

these forces in recent years. A consideration that will have a bearing in future attempts to keep maintenance costs under control is the possibility that higher wage rates will soon prevail, which will mean that, unless there is a compensating increase in efficiency, larger expenditures will be required to accomplish the same amount of work. For this and other reasons the problem

of costs is being viewed with a great deal of concern by maintenance men everywhere, although they are not without plans for coping with it. Among the factors that are certain to play an important role in the struggle to reach higher levels of efficiency is the utilization of power machines and tools on a wider and more intensive scale than ever before, a prospect that is commented upon at length elsewhere in this issue.

Construction Activity

During 1945 railway construction activity involving additions and betterments continued at about the same pace as in 1944, with the total expenditures for this purpose amounting to about \$250,000,000. Thus, as in the earlier years of the war, the volume of improvement work carried out by the railroads remained at a moderately higher level than during the immediate pre-war years, when expenditures for this purpose averaged only \$134,865,700 annually for the 10-year period, 1932-41. This does not mean, however, that any great amount of progress has been made in recent years in reducing the back-log of needed improvement work that accumulated during the period of relative inactivity.

Because of the shortages of materials, and government restrictions on construc-

tion work, the types of improvement projects that the railroads were permitted to undertake during the war period, including most of 1945, were confined largely to those that had a direct bearing on the ability of the roads to handle war traffic. This meant that very little progress was made in carrying out improvements designed to reduce costs through greater efficiency or to enhance the attractiveness of railroad service generally — improvements that are recognized as necessary to strengthen the competitive position of the railroads in the post-war period. With the various transportation agencies busy gathering their forces for the coming struggle for supremacy, the demand for improvements of these types is now more insistent than ever, and it is logical to expect that the near future will see a substantial increase in some of the various categories of railway construction activity.

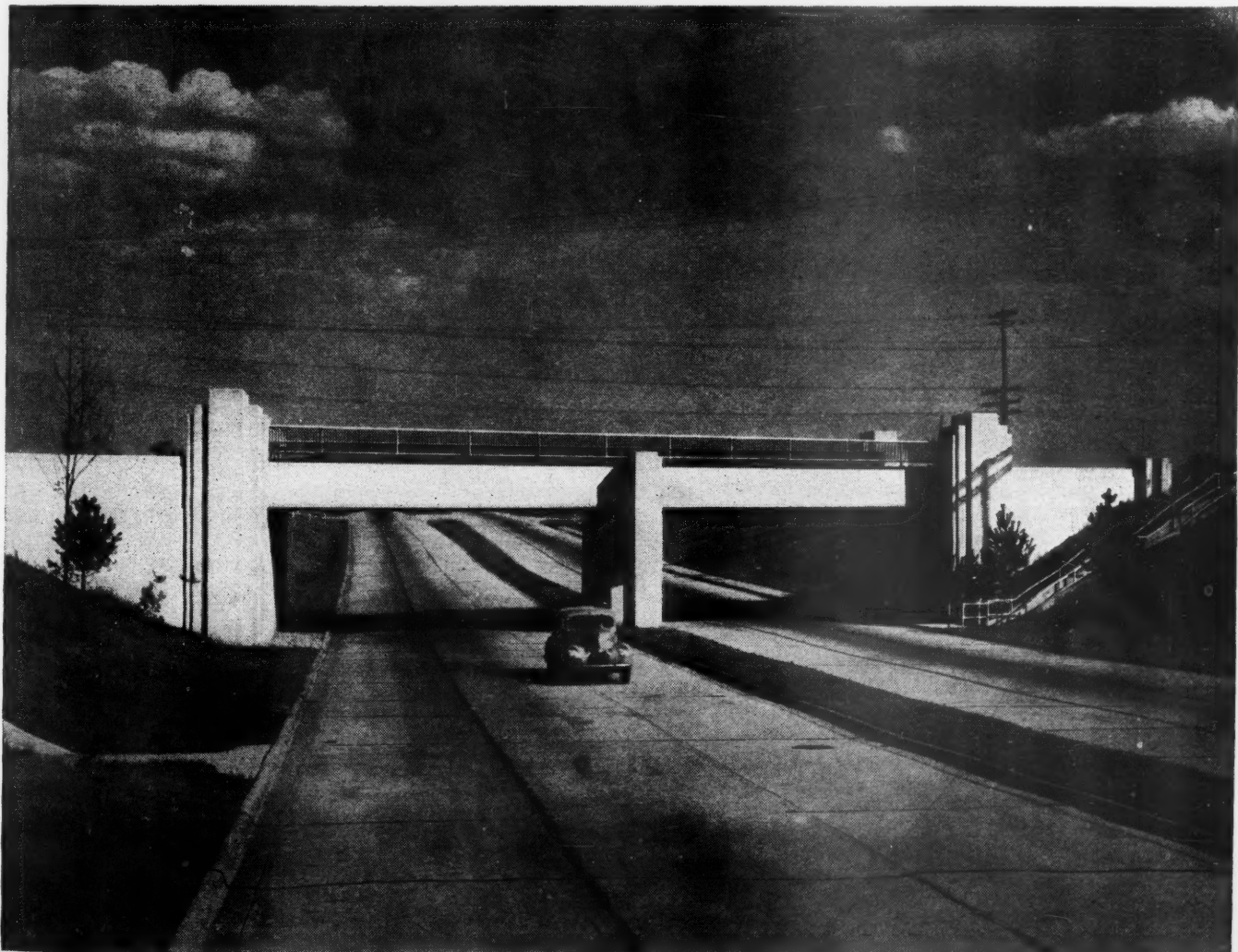
The types of work that are likely to receive major attention are curve-reduction and line-change projects and related undertakings; the revamping of locomotive servicing facilities at terminals and on the line, not only to reduce operating costs but to speed up the handling of locomotives at terminals and to shorten the time required to service them en route; the modernization of both passenger stations and freight-handling

facilities; the strengthening or reconstruction of bridges with inadequate load ratings; the replacement of obsolete facilities of all types where advantages in the form of reduced costs and greater efficiency can be obtained; and a continuance of the programs to strengthen the tracks by means of heavier rail, more adequate ballast sections, longer ties and other means. Also, because of the increasing use of Diesel power, it is expected that additional roads will find it necessary to provide facilities for repairing and servicing such power. Further, assuming that the necessary public funds are forthcoming, it is likely that there will be a considerable revival of activity, largely dormant during the war, having to do with construction for the elimination of railway-highway grade crossings.

Modernity a Commercial Need

To compete successfully with their rivals the railroads must have a fixed plant that is as up-to-date in design and construction as the ultra-modern passenger equipment that will soon be going into service. On most roads the plans and estimates for the changes necessary to produce such a plant have already been prepared; it remains now to make the decisions required to put them into effect.

The resumption of grade-crossing elimination work on a considerable scale can be expected





Variety in Motive Power Promised by Developments of the Future

IN looking back over 1945 a number of events have transpired that are of interest to those who are concerned with motive power on American railroads. Needless to say, that of most far-reaching influence was the end of hostilities in World War II with the resultant dislocations in industry and railroad traffic. The character and the volume of traffic in 1945, as compared with previous periods, is dealt with in other articles in this issue but, as far as the use of motive power is concerned it may be generally stated that the end of the war brought about an increase in the demand for passenger motive power, as measured by locomotive-miles, and a decrease in the demand for freight power. This latter decrease is a reflection of the changed conditions in the movement of freight

By H. C. WILCOX
Associate Editor

and, in September of 1945, there was a 12 per cent reduction in total freight locomotive mileage as compared with September, 1944.

The falling off in the demand for freight power actually began before the end of the war. This statement is made upon the assumption that the demand for power is immediately reflected in the totals of active locomotives, shopped power and stored serviceable power. In May, 1945, for example, the number of stored serviceable locomotives exceeded the 500 mark for the first time since before the war began. So, also, did the

number of unserviceable locomotives exceed the 3,000 mark for the first time since before the war. In September, 1945, less than 60 days after V-J Day, there were 1,121 stored locomotives and 3,240 on the shopping list leaving a total of only 17,900 locomotives in the active freight motive power inventory. Locomotive mileage, in freight service, had dropped from over 70 million to a low of 56.9 million miles and, as an indication of the work done, the gross ton-miles had reached a low of 118 billion from a high of over 145 billion.

Without any question a large part of the freight power taken out of service and stored was of ancient vintage and, if the figures for the individual roads were available, they would no doubt show that the modern steam and Diesel

units were carrying a proportionately greater share of the freight mileage. While there is no way of separating the mileage made by the modern steam units from the rest of the locomotives, except in the records of individual roads, it is possible to analyze the records of Diesel power.

The average monthly total mileage made by all steam freight locomotives for the first seven months of 1945 was 61.7 million. In the month of August this dropped to 57.4 million, and in September to 52.5 million. The average monthly total mileage made by Diesel freight locomotives for the first seven months of 1945 was 2.9 million, but, unlike the steam performance, this increased to 3.4 million in August and 3.3 million in September. It is reasonable to expect that the marked drop in the usage of steam freight power was due, in large part, to the removal from service of many of the older units. Like the Diesel figures, an analysis of the performance data with respect to the less-than-10-year-old steam power would probably show that these units were used with greater intensity in August and September than in the early months of the year. No doubt, also, with the pressure of wartime traffic demands removed, a number of locomotives formerly kept on the active list as protection were placed in storage.

Considerations for the Future

At this moment the railroads have finally reached a point where they must change over from the job of handling traffic regardless of cost to the peacetime job of handling traffic at a profit. Practically all of the expenses of operating motive power have increased and some indication of the cost of keeping things going during the war period can be seen from the fact that with a practically constant volume of locomotive mileage during the four war years the annual cost of maintenance of equipment increased more than 30 per cent in the first nine months of 1945 over a like period of 1942. Only a corresponding increase in the work done by motive power units can justify the higher per-mile costs of maintenance and operation.

One thing is certain and that is that no 25- or 30-year-old locomotive can compete in tomorrow's main-line traffic and when work is related to cost there will be little dispute over the fact that a large part of the rapidly mounting increases in unit operating and maintenance costs is attributable to the large numbers of older units.

So, there we stand, and it is now the motive power man's move—in the direction, it is to be hoped, of a broad-gaged motive power policy. Now that the job of handling peacetime traffic is here again what shall it be done with—

Table 1—Selected Statistics of Motive Power and Freight Train Performance

	Total freight locos.	Unservice-able	Stored Service-able	Active locos.	Per cent active to total	Loco. miles (000)	Gross ton-miles (000,000)	Freight train-miles (000)	Freight car-miles (000,000)
1929									
October	28,912	4,417	2,680	21,755	75.3	64,756	110,444	56,748	2,783
1942									
October	22,027	2,344	340	19,343	87.8	70,461	141,880	60,717	3,155
1943									
October	22,037	2,703	335	18,999	86.2	70,084	145,076	60,355	3,185
1944									
January	22,351	2,666	310	19,375	86.6	68,927	137,118	59,489	3,020
February	22,341	2,808	307	19,226	86.1	66,547	132,795	57,367	2,913
March	22,291	2,609	264	19,418	87.1	70,993	142,638	61,306	3,165
April	22,265	2,814	341	19,110	85.8	66,868	137,350	57,832	3,043
May	22,316	2,783	436	19,097	85.5	69,279	144,110	59,894	3,167
June	22,199	2,682	498	19,019	85.6	66,136	138,663	57,179	3,044
July	22,253	2,804	495	18,954	85.1	67,478	141,533	58,315	3,115
August	22,334	2,707	493	19,134	85.7	68,149	144,163	59,067	3,157
September	22,388	2,758	462	19,162	85.6	65,106	137,172	56,329	3,002
October	22,398	2,796	465	19,137	85.6	67,948	143,539	58,884	3,115
November	22,457	2,895	483	19,079	84.7	65,095	134,164	56,463	2,961
December	22,432	2,857	430	19,145	85.3	65,492	129,119	56,974	2,844
1945									
January	22,414	2,911	342	19,161	85.3	65,637	127,440	56,885	2,768
February	22,464	2,949	381	19,145	85.0	60,895	122,608	52,747	2,654
March	22,456	2,741	349	19,366	85.9	69,276	143,852	59,901	3,150
April	22,323	2,977	441	18,905	84.7	65,739	138,369	57,080	3,043
May	22,339	3,016	520	18,803	84.3	68,852	145,792	59,939	3,205
June	22,352	2,861	621	18,870	84.3	65,750	139,723	57,155	3,042
July	22,307	3,096	628	18,583	83.3	65,067	136,869	56,547	2,988
August	22,297	3,098	817	18,382	82.4	61,916	128,842	53,895	2,838
September	22,261	3,240	1,121	17,900	80.3	56,907	118,021	49,477	2,576

Note: Data in Columns 1 to 4 from I. C. C. Statement M-240 OS-F; columns 6 to 9 from I. C. C. Statement No. M-211 OS-A; Column 5 calculated.

steam, Diesel or electric? There are many motive power men who seem to have made up their minds but developments that are under way at this time may make it highly desirable to approach this question with an open mind.

Ralph Johnson, chief engineer, Baldwin Locomotive Works, in a paper presented recently before the American Society of Mechanical Engineers discussed at length many of the factors that influence the trend in locomotive design, such as physical limitations of roadbed and clearances, available fuel supplies, labor demands, traffic reciprocity, locomotive economics and operating practices, in such an understandable manner that excerpts from his discussion having an important bearing on the motive power question are included here.

Speaking of the availability of fuel, Mr. Johnson remarked that "locomotives consume about 20 per cent of our coal production and 14 per cent of the fuel oil. The choice depends upon availability and cost. Roads in the Southwest

and far Western states run through oil country and in some cases own oil properties. It is only natural that they should burn oil both in steam locomotives and Diesels.

"In 1943 U. S. railroads carried 774 million tons of bituminous coal, which is roughly one-quarter of the total freight carried. The revenue from this amounted to over 900 million dollars or slightly more than one-eighth of the railroads' gross revenue of 7.1 billion dollars. In the same period they used one-fifth of the total coal produced in the U. S. or about 124 million tons which, at an average cost of \$3.33 per ton amounts to about 413 million dollars. An industry which provides 900 million dollars' worth of revenue can hardly be ignored.

"In a more normal year, 1938, the U. S. railroads received about 37 million dollars of revenue from the oil industry but spent 57 million dollars for fuel oil and gasoline. In the same year the railroads received 511 million dollars for coal transportation but only paid out to the coal industry 174 million dollars for coal. Thus, the oil industry recovers 155 per cent of its outlay to the railroads while the coal industry recovers only 34 per cent. Whenever the use of oil grows to large proportions in any area the oil companies leave the railroads and either ship by tanker or construct pipe lines. This reciprocity aspect of the fuel supply should of itself insure the use of coal-burning locomotives for many years and also influence the trend of locomotive design for there are many indications that powdered coal can some day be burned in Diesel engines and gas turbines."

In speaking of labor demands, Mr. Johnson said that, "The trend toward any particular type of motive power is affected if labor requirements on one

The war's end brought to a close a five-year period of the most intensive utilization of motive power and equipment in the history of railroading and it also brought to a close a period in which the cost of providing the power for the handling of trains was not the major consideration. With the end of this period the roads are now faced with the job of meeting peacetime competition, and if much of the obsolete equipment and facilities are maintained in service the high cost may be a serious handicap.



type are greater than another. The design of a steam locomotive is such that it is difficult to find either a place or duties for more than two men. This is also true of the electric locomotive. However, where two steam or electric locomotives double-head, two crews are used. The trend is, therefore, to single units requiring but one crew. Diesels usually operate in road service with two, three or four units. If more crew members were demanded, or even a maintainer in rear units it would be a severe economic handicap for the Diesel locomotive in its present form. Single-unit Diesels of high horsepower capacity would then seem to be the preferred form of design."

In the matter of economics, Mr. Johnson said that, "The trend of future motive power will primarily be dependent on economies, as steam, Diesel or electric locomotives can be designed to handle any given service. Despite individual advantages the major swing to any particular type of power will be on the basis of the greatest return on the capital invested. Therefore, it is desirable that there should be some standard method of ascertaining locomotive operating costs.

"Many railroads do not allocate running repairs to individual locomotives. Such a practice penalizes new power,

for repair costs rise with age. Also, it is common practice not to include capital charges in an operating cost statement. This gives misleading results; obviously comparing two locomotives, one of which costs twice as much as the other, without including amortization, interest and taxes, gives a false picture. Again, if two types of motive power are being considered, new units of both should be compared with the power being replaced, not a new unit of one with an old unit of the other, for this ignores both the influence of age on costs and advancement in the art.

"A necessary factor in determining operating costs is the service life of a

locomotive for on it depends the amortization of the investment, the interest, the interest charge and the average cost of repairs. The difficulty in arriving at a reasonable figure for service life probably accounts for the general practice of omitting capital charges from operating statements. The life of a locomotive, if given regular overhauls, is not based on the wearing out of the machine, for it can be repaired indefinitely and will still haul the same train at the same speed and with the same consumption of fuel, water and oil as when new, though there may not be a single pound of the original material still in it. Therefore, the service life of a locomotive is based on obsolescence. There are methods of calculating economic life of locomotives, but usually an estimated service life is based on the experience of each particular road. It would be of great assistance to railroad management were some standard practice evolved for ascertaining an economic life for locomotives. This would clarify the problem of setting up intelligent replacement programs."

That operating practices have an important bearing on motive power is indicated in his remarks to the effect that "It has long been evident that the utilization of motive power by the railroads has lagged far behind the technical ad-

Table II — Comparison of Locomotive Mileage by Type of Power and Class of Service

	(Nine Months Ending September, 1945)		
	1945 (000)	1944 (000)	1943 (000)
Road Freight Service:			
Steam	541,731	582,371	592,493
Diesel	27,443	14,558	10,602*
Electric	10,428*	11,009*	6,448
Road Passenger Service:			
Steam	301,613	307,228	296,839
Diesel	29,696	24,832	18,201*
Electric	18,850*	18,785*	30,767

* Includes gasoline and other locomotives.
Note: Data from I. C. C. Statistics of Freight Train Performance, Statement No. M-211 and Statistics of Passenger Train Performance, Statement No. M-213.

vances of locomotives, cars and roadbed. The railroads owe a lot to the Diesel locomotive outside of its performance characteristics, for throwing the spotlight on this feature of operation. The high cost of this type of power necessitated that it be kept in intensive service and this in turn required new techniques in maintenance and use. Almost without exception, these principles are equally applicable to other types of railroad motive power and if they pay dividends with Diesel power it is reasonable to ask why they are not just as desirable for steam power.

Maximum Utilization

"Railroads are actively studying this question of maximum utilization of motive power and many economies are being discovered which were overlooked before the Diesel locomotive drew attention to these matters. No matter what type of motive power they are applied to, the result of greater locomotive utilization will be lower operating costs and an improvement in the railroads competitive position."

Mr. Johnson dealt, at considerable length, with the new developments such as Diesel and electric locomotives; poppet valves; pulverized coal; higher temperatures and pressures; welded boilers; four-cylinder locomotives; steam turbine locomotives and gas turbine locomotives, that are actually in the making in the field of motive power design and concluded his paper with these observations:

"The electric locomotive will be used wherever traffic density permits. Government water power projects, undertaken primarily for flood control or irrigation reasons, may make available electric power at reduced rates which will increase its use. Modern electric locomotives have high acceleration and good tracking qualities and I do not believe their design will change radically.

"The Diesel locomotive will increase in popularity and if it can retain its standardized design will decrease in price. Improvements will take the form of lighter, more compact and higher speed engines, probably in a fewer number of cabs than at present. A successful mechanical transmission will improve weight and efficiency characteristics.

"The steam turbine locomotive appears to fit high-speed passenger and freight service admirably. If its individual components stand the test of service as they have to date it should be popular as it can burn either coal or oil. If higher pressures and temperatures are practicable on locomotives it can take full advantage of them. With geared transmission it can be built in

conventional sizes without exceeding permissible axle loads. With electric transmission more wheels are necessary for equivalent power and axle loads on account of the great weight of electrical equipment.

"The gas turbine locomotive offers thermal efficiencies equal to the Diesel and like the Diesel requires no water. It has uniform torque at all speeds like the electric, Diesel and steam turbine. So far it cannot burn coal, and is tied up to electrical transmission. It should give the Diesel stiff competition.

"The reciprocating steam locomotive cannot hope to match any of the foregoing in thermal efficiency. However, it cannot be brushed aside for it is a simple, flexible and cheap machine that is ideally suited to railroad operating conditions. It is improving constantly in availability which is the characteristic of most interest to operating men. Railroads are giving it more and more attention in servicing and maintenance facilities and thereby getting more out of it. It costs half as much as any other existing type of power and in a field where demand fluctuates widely, this is an item to be weighed carefully.

"Finally, motive power choices are dictated in the long run by economics. No generalizations can be made, for density of traffic, first cost, economic life, terrain and various operating conditions, if given their proper consideration, decide. And in addition to these engineering considerations, there are various commercial angles that weigh heavily in motive power choices. But whatever the type, I am sure locomotive business will be good for many years to come."

An Era of Progress Ahead

It is difficult to subscribe to the thinking of those who express the thought, occasionally, that progress in the design and utilization of railroad motive power is slowing up; that the railroads will not be able to meet the competition of the future. There is every evidence that the very spur of competition, whether it be in the form of Diesel, electric or new types of steam power has already provided the spark that is initiating a period of intensive research and development and that the coming months will see improvements that are not at this moment being taken into consideration. This has happened before in the history of motive power and if any proof of this fact is needed it can be found in the remarks recently made by Joseph B. Ennis, senior vice-president, American Locomotive Company. Mr. Ennis' comments on the activity in the motive power field and his confidence of better things to come in the future make it worthwhile to repeat

these excerpts from an address delivered recently at a dinner in his honor in New York City:

"To me it seems that the future holds an expanding role for both the steam locomotive and the Diesel. More electric locomotives will be used also, but they will be confined chiefly to areas of congested traffic.

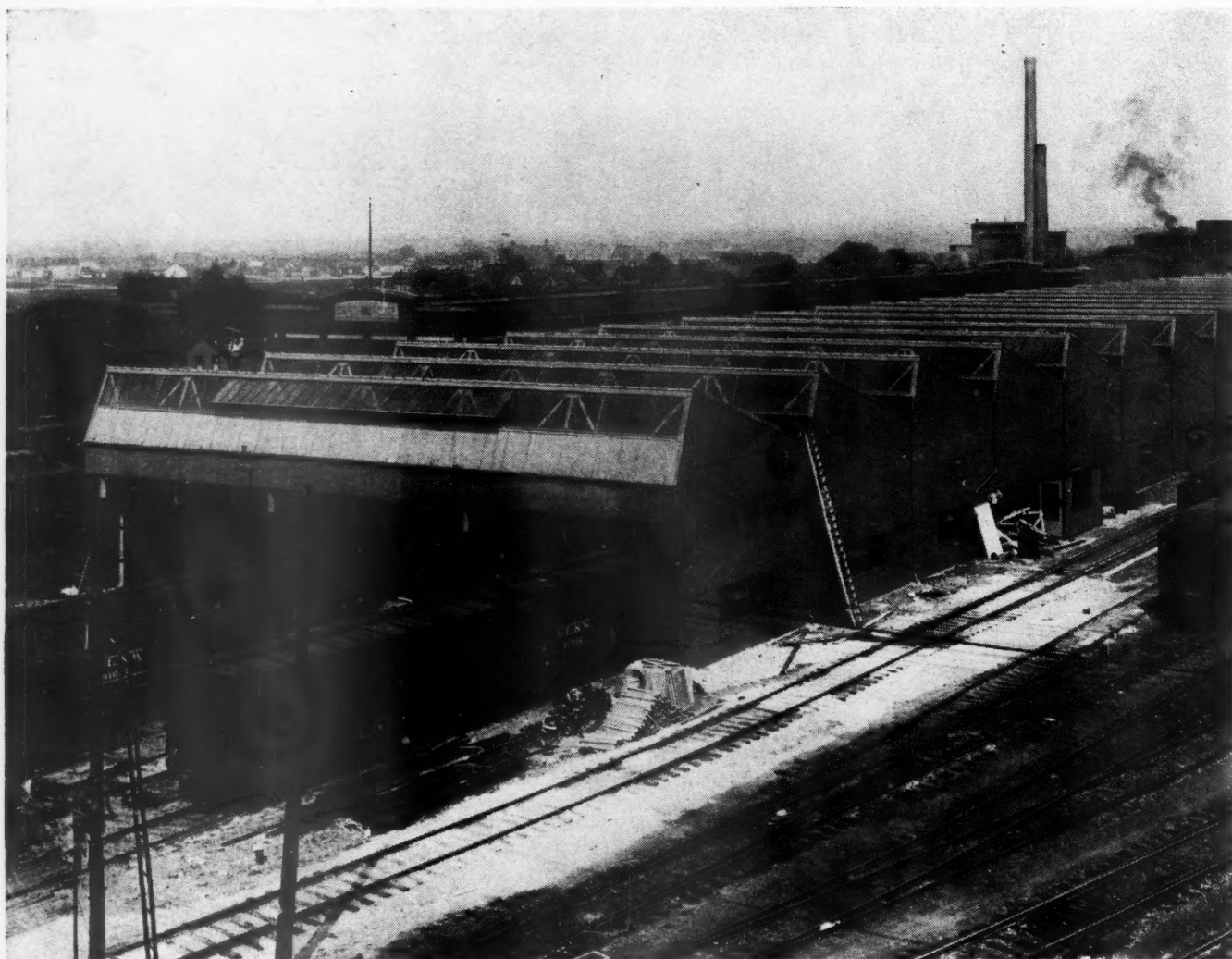
A Diesel Trend

"At the moment the trend toward the Diesel is strong. The Diesel has won its place alongside the steam locomotive the hard way—by sound service on the road and by constant improvement on the drafting boards and in the experimental models. There are Diesel engines in stationary service—and not old ones at that—where weight per horsepower is over 300 lb. and the rotative speed 100 revolutions per minute. Contrast this with the comparable figures for Diesel engines in locomotive units today. We have the weight per horsepower down to 18 lb. and the rotative speed up to 1,000 revolutions. Then remember that we are looking forward to still lighter weight, higher rotative speeds, higher mean effective pressures, and greater output per cubic inch of cylinder volume.

"While the Diesel has been stepping out, however, the steam locomotive has not been standing still. I need merely mention the use of stokers, poppet valves, unit castings for bed frames of both tenders and locomotives; high-temperature superheating, feedwater heating, the use of roller bearings; the dividing of power into two systems with two cylinders each, and the replacement of the riveted with the welded boiler.

"Under the spur of competition, the steam locomotive is reaching new records of availability. During the past few months, one locomotive of the conventional reciprocating type made 26,928 miles in passenger service in one month and followed the next month with the same daily average. Steam still has the advantage of much lower initial cost than the Diesel—and this advantage can be heightened whenever the railroads see their way to accepting the same degree of standardization in the steam locomotive that they have accepted in the Diesel.

"I, for one, have no doubt that the railroads—and their suppliers—will meet the challenge and the opportunity of postwar mass transportation. I confidently predict that in the ten years following the war the American railroads will handle the greatest volume of passenger as well as freight traffic they have hauled in any peacetime decade in history."



Many heavy repair programs are under consideration for 1946

A Moderate Increase in Freight-Car Orders Probable During 1946

By C. B. PECK
Mechanical Department Editor

THE year 1945 closed with definite evidences of an easing off of the pressure on the supply of freight cars. During 1942 the demand for cars to load increased rapidly and reached sustained highs during 1943 and 1944. Third quarter loadings were 11.2 million in 1942 and reached 11.4 and 11.5 millions in 1943 and 1944, respectively. At the same time the supply of new freight cars was sharply curtailed. Hence, during these two years the utilization of freight cars attained degrees of intensity which few persons associated with railway transportation had dreamed were possible. For each of the three years immediately following Pearl Harbor the new cars delivered never reached the

estimates of the numbers of new freight cars needed by 40,000 to 50,000 cars. With surpluses on numerous occasions reduced to fewer than 10,000 cars, the railroads were operating many months with reported shortages well below 5,000 cars—an amazing degree of liquidity of the car supply.

Now the pressure is being reduced. Carloadings are dropping off (to 10.8 million during the third quarter) and car-miles per car day, which during the fall months of 1942, 1943 and 1944 aver-

aged close to 50, are now below 44—only about one mile higher than during the same season of 1941. The tons per loaded car have not yet shown a decline, but the reduced car-miles lowered net ton-miles to 952 last September. While this is still somewhat higher than the 824 of September, 1941, it marks a definite decline from the more than 1,000 which began in September, 1942, and prevailed substantially throughout 1943 and 1944.

Evidence of the physical strain to which freight cars were being subjected has been accumulating for more than a year. Contrary to the experience of the railroads during World War I, when the necessity of mixing wooden cars of

Wartime demand for loading and sharp curtailment in the supply of new cars led to unprecedented intensities of freight-car utilization during 1943 and 1944. Carloadings are now dropping off and the lowered intensity of utilization is reflected in fewer miles per car-day and more cars set aside for repairs. In the face of uncertainties resulting from general labor unrest, the 1946 outlook is clouded. As the new year begins moderate increases in the number of new freight cars ordered seem probable.

inadequate strength among the much stronger and stiffer steel cars caused all too many cases of derailment, the running condition of freight cars has seldom shown serious deterioration during World War II. The deterioration evident during this war has been in conditions affecting lading, particularly in the down-grading of box cars, especially as the result of floor and lining conditions. The extent of this has been difficult to measure because statistical evidence of these conditions has not been available. The number and percentage of cars undergoing or awaiting repairs are less an indication of the condition of the cars than of the pressure of the demand for their use. Thus, the increase in the number of railroad-owned cars undergoing or awaiting repairs from 3 per cent to 4.4 per cent in the year from October 1, 1944, to October 1, 1945, in all probability signifies approximately the extent of the reduced pressure for cars and does not measure the real need for shopping cars, particularly those in need of heavy repairs.

The Outlook for 1946

As in many other fields, the outlook for the building of freight cars during 1946 is clouded with many uncertainties. First is the overall effect on railway traffic and earnings of the lag in industrial production caused by strikes. This will influence the extent to which the railways will come into the market for cars during the year. Then there is the uncertainty as to the effect of the prospective steel strike on the supply of materials. Thirdly is the prospective labor supply in the car-building industry. More men will probably become available as the year advances and as post-war vacations at government expense come to an end.

Physical facilities at peak capacity are available in the United States for building more than 200,000 freight cars annually. In the light of the above uncer-

tainties, it seems probable that not more than half—and probably less than half—of this top output can be attained during 1946.

But how about the probability of orders?

Materials Set "Ceiling"

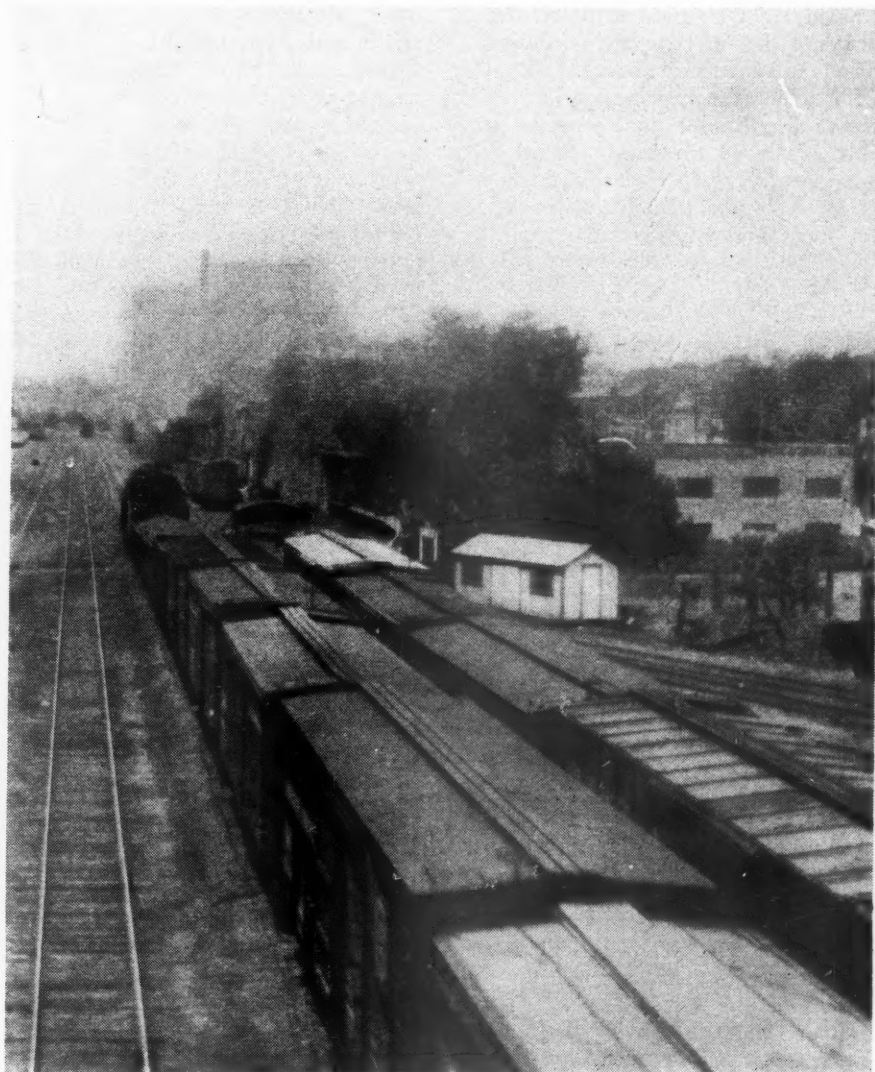
During the war years, including 1945, orders were never placed for more than about enough cars to use the material allocations made available by the War Production Board. In 1944 these totaled something under 50,000; in 1945, less than 40,000. As last year ended, there was little evidence of extensive plans for large freight-car orders during 1946. Based on year-end indications, a volume larger than 50,000 does not seem probable. Crystallization of plans on the part of individual railroads as the year advances may increase this figure.

Two other factors affect the future condition of the freight-car inventory: the trend in the number permanently removed from service and the extent to

which present run-down equipment will be restored by rebuilding. The numbers of freight cars dismantled or destroyed yearly have been on the increase since 1943 when fewer than 8,000 cars were permanently removed from service. In 1944 the number had increased to 10,700 and for the first ten months of 1945 to 21,600. While the trend is in the right direction, the number of cars involved is far from enough to have any material effect on the general condition of the inventory as a whole. A larger number of retirements may be expected during 1946 but there is little evidence at present that the increase will be large.

Repair Programs

Several heavy freight-car-repair programs are under consideration for 1946, the extent of some of which will be determined by the ability to secure the materials needed in sufficient quantities. Such programs of rebuilding and heavy repairs will undoubtedly expand during the year.



Freight-car movements slowed up in 1945

M. R. S. Inactivation Progresses

**Railroad-sponsored units are returned to "stand by" status—
not completely disbanded—after making a spectacular record
in supplying a swiftly-changing world-wide battlefield**

AS the year ended, the war-time task of the Military Railway Service had practically been completed; many units had been returned to the United States and "inactivated"; and those still overseas were, with a few exceptions, on the alert for orders to board ships to return home. M.R.S. headquarters in Paris were closed October 24, and Maj. Gen. Carl R. Gray, Jr., director general of the M.R.S. in Europe, with his staff, arrived at New York November 9, continuing directly to St. Paul, Minn., to be mustered out of active service.

Unlike many of the "fighting" parts of the Army, however, the railroad operating and shop battalions, along with some other units organized and trained for specialized technical duties, are not being completely disbanded. Thus the War Department is continuing with a long-range plan, put into effect before hostilities began, whereby suitably organized railway personnel with a high degree of specialized training will be available under company sponsorship for rapid orderly conversion from civilian to military duties whenever the need arrives.

Army Policy

The Army's policy in this respect is to "preserve affiliated units and sponsored units for possible use in the post-war Army. Continued sponsorship of units by business firms and institutions during the post-war period will not only preserve interest in national security, but will also speed the reactivation of units whenever necessary. Moreover, the historical continuity of these units will be assured if they are inactivated rather than disbanded. This should materially enhance the pride of the sponsoring organization in its unit. Affiliated units will become a part of the reserves."

Most large American railroads have sponsored one or more railway shop or operating battalions during the recent war, and their sponsorship of these units, and the affiliation of their trained employees with them, is expected to continue under this War Department program. The accompanying list indicates units sponsored by the different railroads which are being "inactivated"; in addition there were a few battalions

By C. B. TAVENNER

Associate Editor

which do not come within this category, especially those not sponsored by individual railroads but by the M.R.S.

The speed with which railroad battalions are being returned from Europe has depended in recent weeks on the available transportation and "staging" space, as their responsibilities for the maintenance and operation of railway facilities overseas have been transferred almost entirely to civilian administrations or organizations set up under the occupational authorities. The same is true of units which were assigned to other Old World theaters. The return and inactivation of M.R.S. units assigned to the Pacific theater, however, has not progressed so rapidly, and dates for the accomplishment of this phase of the program were not available as this was written. Those units which had been returned from the several theaters up to mid-December are listed in the table, and as it indicates most of those units had been inactivated at that time.

Important parts of the story of M.R.S. achievements overseas have been told in these pages from time to time. The first major operation in which railway battalions were engaged was the first major operation in this war for

American railroad men in Army railway battalions in the recent war have made transportation history which can be summarized adequately only after a thorough and painstaking study of reports and data assembled from every theater of military activity. Some parts of that story have been told already, in words and pictures, in *Railway Age* pages. Now that the record has been made and the victory has been won, the Military Railway Service is resuming its peace-time role of inactive readiness as rapidly as personnel can be returned from overseas. The present status of that program of "inactivation" is briefly outlined here.

American armies, that is, the invasion of North Africa. A review of the railroad facilities available in that region, illustrated by a map, appeared in *Railway Age* of March 6, 1943, page 456, and accounts in later issues have described the difficulties experienced in this initial combat and support operation of American railroad men in uniform.

A few weeks later the first news of activities of M.R.S. men in Iran—far from the scene of actual fighting, but squarely in the middle of a vital line for the movement of supplies to a hard-pressed battlefield—appeared in print. This was followed by a number of articles describing conditions in that area, particularly that in the issue of July 22, 1944, page 152, which in words, pictures and maps depicted a highly successful accomplishment of an essential railroading job under unusual circumstances. Other articles have described the operation of railroads in India and Burma, the Philippines, and Alaska, which have called for the exhibition by M.R.S. personnel of skills and stamina sometimes far beyond anything contemplated by their training routine and their experience on home railroads.

But the main strength of the Army's railroad battalions was concentrated in Europe, supporting the invasion that led to the collapse of Italy and Germany. The story of their experiences in Sicily, in the "boot" of Italy, and as the fighting front swept from Normandy across France and the Rhine deep into Nazi territory has been told in considerable detail in these pages. Important though the earlier operations were, the most severe test of M.R.S. organization and training was the task of supplying these ever-growing armies as they spread from the beachheads eastward almost to Berlin. The map shows the main railroad lines in France, Belgium, Luxembourg and Germany which were operated by the M.R.S. at some time during the period from D-Day to May 8, 1945, when the enemy gave up.

Supplying the Western Front

Army railroaders were running a flange-wheeled "jeep" on the Cherbourg peninsula 11 days after the first troops

List of Military Railway Service Units Being Inactivated

Unit	Sponsor
Headquarters and Hq. Companies	
1st Military Railway Serv.	Chicago, St. Paul, Minneapolis & Omaha
701st Railway Grand Div.	New York Central
703rd Railway Grand Div.	Atlantic Coast Line
704th Railway Grand Div.	Great Northern
705th Railway Grand Div.	Southern Pacific
706th Railway Grand Div.	Pennsylvania
707th Railway Grand Div.	Southern
708th Railway Grand Div.	Baltimore & Ohio
710th Railway Grand Div.	Atchison, Topeka & Santa Fe

Railway Operating Battalions

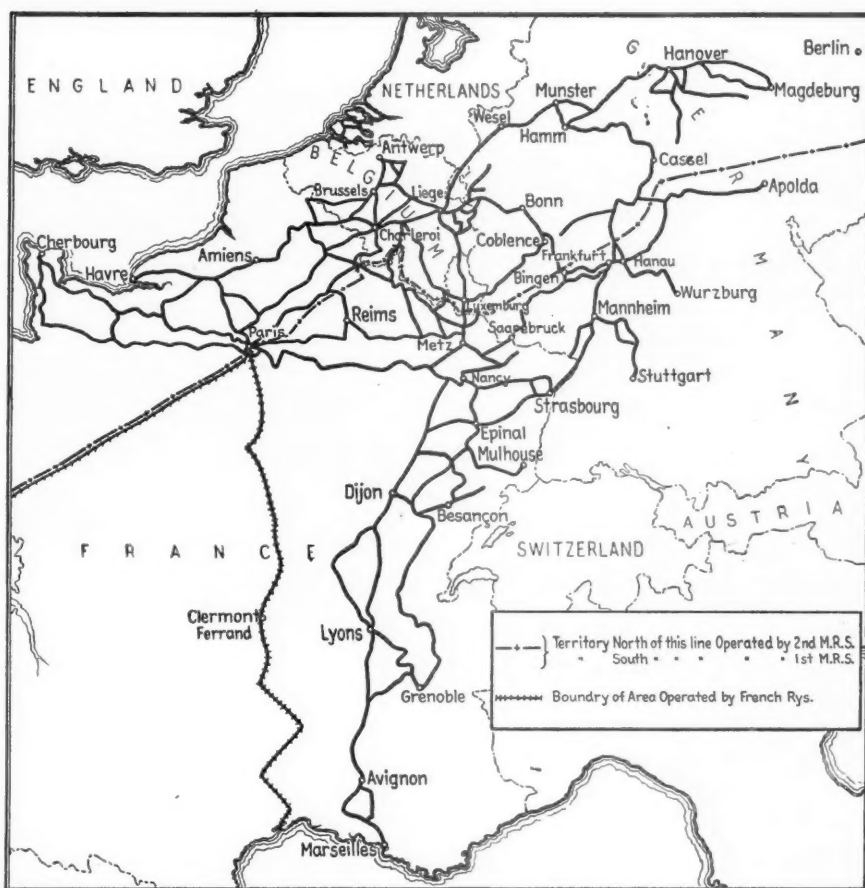
712th	Reading
713th	Atchison, Topeka & Santa Fe
714th	Chicago, St. Paul, Minneapolis & Omaha
715th	Illinois Central
716th	Southern Pacific
717th	Pennsylvania
718th	New York Central (Big Four)
719th	Southern Pacific
720th	Chicago & North Western
721st	New York Central
722nd	Seaboard Air Line
723rd	Union Pacific
724th	Pennsylvania
725th	Chicago, Rock Island & Pacific
726th	Wabash
727th	Southern
728th	Louisville & Nashville
729th	New York, New Haven & Hartford
730th	Pennsylvania
732nd	Great Northern
733rd	Central of Georgia
734th	Southern Pacific
735th	Erie
737th	New York Central
740th	Chesapeake & Ohio
741st	Alton
743rd	Illinois Central
744th	Chicago, Milwaukee, St. Paul & Pacific
745th	Chicago, Burlington & Quincy
746th	Missouri-Kansas-Texas
748th	Texas & Pacific
749th	New York, New Haven & Hartford
750th	St. Louis - San Francisco
752nd	Boston & Maine
759th	Missouri Pacific

Railway Shop Battalions

753rd (Diesel)	New York Central (Big Four)
754th (Steam)	Southern Pacific
755th (Steam)	Norfolk & Western
756th (Steam)	Pennsylvania
757th (Steam)	Chicago, Milwaukee, St. Paul & Pacific
758th (Steam)	Atchison, Topeka & Santa Fe
762nd (Diesel)	American Locomotive Company
763rd (Steam)	Delaware, Lackawanna & Western
764th (Steam)	Boston & Maine
765th	Erie

Progress in Inactivation of M. R. S. Units

Unit	Sponsor	Inactivated
701st Railway Grand Division	N. Y. C.	Oct. 13, 1945
703rd Railway Grand Division	A. C. L.	Nov. 4, 1945
704th Railway Grand Division	G. N.	Arrived in U. S. Nov. 29, 1945
705th Railway Grand Division	S. P.	Inactivated Nov. 26, 1945
708th Railway Grand Division	B. & O.	Arrived in U. S. Dec. 11, 1945
711th Railway Operating Battalion	M. R. S.	Inactivated Oct. 20, 1945
712th Railway Operating Battalion	Reading	Arrived in U. S. Dec. 9, 1945
713th Railway Operating Battalion	A. T. & S. F.	Inactivated Oct. 6, 1945
717th Railway Operating Battalion	P. R. R.	Arrived in U. S. Dec. 9, 1945
718th Railway Operating Battalion	Big Four	Inactivated Dec. 4, 1945
719th Railway Operating Battalion	T. & N. O.	Inactivated Nov. 20, 1945
720th Railway Operating Battalion	C. & N. W.	Arrived in U. S. Dec. 5, 1945
721st Railway Operating Battalion	N. Y. C.	Inactivated Nov. 26, 1945
725th Railway Operating Battalion	C. R. I. & P.	Inactivated Oct. 29, 1945
726th Railway Operating Battalion	Wabash	Inactivated Nov. 26, 1945
727th Railway Operating Battalion	Southern	Inactivated Oct. 6, 1945
728th Railway Operating Battalion	L. & N.	Inactivated Nov. 23, 1945
729th Railway Operating Battalion	N. Y. N. H. & H.	Inactivated Nov. 19, 1945
730th Railway Operating Battalion	P. R. R.	Inactivated Oct. 20, 1945
733rd Railway Operating Battalion	M. R. S.	Arrived in U. S. Dec. 15, 1945
745th Railway Operating Battalion	C. B. & Q.	Inactivated Oct. 29, 1945
748th Railway Operating Battalion	T. & P.	Inactivated Nov. 26, 1945
754th Railway Shop Battalion	S. P.	Inactivated July 25, 1945
756th Railway Shop Battalion	P. R. R.	Arrived in U. S. Dec. 14, 1945
757th Railway Shop Battalion	C. M. St. P. & P.	Arrived in U. S. Dec. 5, 1945
758th Railway Shop Battalion	A. T. & S. F.	Inactivated Nov. 26, 1945
759th Railway Operating Battalion	M. P.	Arrived in U. S. Nov. 24, 1945
760th Railway Shop Battalion	M. R. S.	Inactivated Oct. 5, 1945
762nd Railway Shop Battalion	Am. Loco. Co.	Inactivated Nov. 20, 1945
791st Railway Operating Battalion	M. R. S.	Inactivated Oct. 15, 1945



European railways operated by M. R. S. when war ended

went ashore in Normandy. Three months after D-Day the rail lines were open to Paris. In another 30 days the M.R.S. railheads were in Belgium, at Brussels and Liege. Meanwhile, other units coming into the south of France had taken over the lines running from Marseilles up the Rhone valley, opening up an additional supply route at a time when the limited capacity of the open Channel ports made the new route vitally useful.

The Rhine crossing began March 24, 1945, and less than two weeks later the

Wesel bridge had been completed and M.R.S. railroad operations east of the river had been started. On V-E Day the service was using bridges across the Rhine at Duisburg, Worth, Ludwigshafen and Mainz, as well as Wesel. The railheads, as shown on the map, were then as far east as Magdeburg (900 miles from Cherbourg) and nearby Oschersleben, Apolda (near Leipzig), Wurtzburg and Stuttgart, and the way was being opened into Munich, Nuremberg, Salzburg and Regensburg.

During the 11 months between D-Day and V-E Day, the M.R.S. loaded and moved more than 18,500,000 net tons of military materials on lines it operated behind the European battlefronts. From 3,000 tons a day in the early operations in Normandy, its output of transportation service rose to 529,275 net tons moved on June 7, 1945, during the period of the Rhine crossings. This was the equivalent of a net ton-mileage for the day of 76,215,456. On that same June 7 the M.R.S. was operating in the western European area 1,937 locomotives, 34,588 freight cars and 25,120 miles of track. Its personnel (not including men assigned to police and security duty), consisted of 1,145 officers, 45 warrant officers, and 25,490 enlisted men, whose over-all average civilian railroad experience was 3.06 years per man.



After four heavy-traffic years and in the face of dwindling tie production, many railway procurement officers are now wondering where a large portion of their 1946 ties are coming from

The High and Low of Forest Products

Large-volume railway requirements built up by four years' intensive utilization go begging because of dawdling production caused by general labor unrest

THE general outlook for crossties is complicated by so many different factors that any brief statement necessarily would have to be qualified in many respects. Many railways hope to secure enough ties barely to meet renewal programs for 1946, but critical shortages are expected by several large systems.

The problem of supply is not nearly as simple as it seems on the surface and will involve many artifices if maintenance departments throughout several territories are to be furnished with all the ties that they plan on using in 1946. Again in some quarters it will be necessary to continue artificial seasoning and boiling ties in creosote mixtures because thoroughly seasoned ties are not available; in other instances below-par inspection standards may be continued in an attempt to obtain the required quotas.

By C. MILES BURPEE

Purchasing & Stores Department Editor

While many procurement officers are hopeful of obtaining barely enough ties to satisfy demands of their maintenance departments, others quite frankly admit that with no solution now in sight, they foresee critical shortages. For instance, one road that renewed more than 2,600,000 crossties in 1945, approximately 3,273,000 in 1944 and 2,712,000 in 1943 may be short more than a million ties in 1946. All in all, the crosstie industry apparently has a long road to travel before it again reaches a degree of sustained production that will maintain a desirable balance between woods production and treating plant deliveries.

Following a steadily downward trend that was established in and maintained since August, 1944, crosstie production and producers' inventories under the spur of price increases began the upward climb last July but production slipped back somewhat in September and October, according to the reports of 10 major producing companies of The Railway Tie Association. This reversal has been attributed largely to withholding tactics employed by contractors and smaller producers in anticipation of increases of O. P. A. ceiling prices which became effective last July 21.

The change of pace was limited to oak, gum and mixed hardwoods, however, and little change was apparent in the production of southern pine ties principally because of the great gap between the prices of lumber and ties of that species. Subsequent O. P. A.

increases in ceilings for southern pine lumber widened the gap still further so that at the year's end southern pine tie production still lagged behind that of other species. On the other hand, while price differentials between lumber and ties still favor oak, gum and hardwood lumber, general demand for lumber of these species has been appreciably less than for southern pine lumber so that competition has not reacted as adversely to crosstie production.

Production Dips 14 Per Cent

It is now apparent that general cross and switch tie production east of the Rocky Mountains is not measuring up to preconceived expectations for the early post-war period, although some localities report sustained increases for the last three or four months. Production slowed down in Kentucky, Tennessee and Northern Alabama when fall and winter rainy periods began somewhat earlier than usual. In the Northwest, both cross and switch tie production have fallen off in about the same ratio as in other areas and sharp competition is in prospect with unusually heavy export programs for China and elsewhere.

September production of both hardwood and softwood crossties (49,051 M f. b. m. softwoods and 65,809 M f. b. m. hardwoods) as reported by the Civilian Production Administration for the country as a whole, dropped more than 14 per cent below the August total. Of the September production, 57 per cent of the total comprised hardwood and 9 per cent were softwood ties produced in the East, while 34 per cent were Western softwoods.

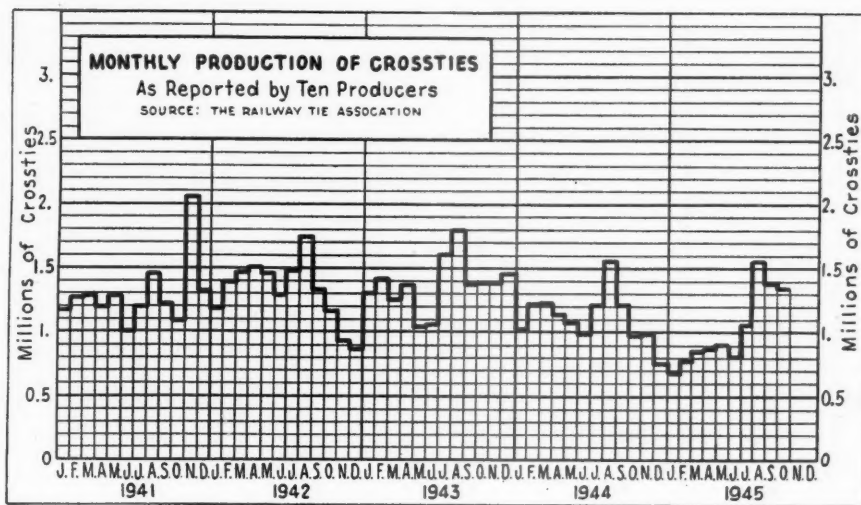
A large tie producer backs his pessimistic observations for the 1946 tie outlook by the declaration that general conditions within the eastern lumber industry are more confused and chaotic than at any time since 1941. Not only did West Coast lumber strikes increase the load upon eastern production but the acute housing shortage and government pressure for the building of more homes have helped promote an extensive black market that steadily grows worse. At least 30 per cent of the mills scattered over a large portion of the entire area and which 90 days ago were sawing crossties, have diverted their production to 1-in. and 2-in. lumber regardless of species, declares this lumberman, because builders, in their excited scramble for lumber, are by-passing the yards and going direct to the mills. Within 48 hours after a truck load of that lumber leaves the mill, the chances are that one will find it already a part of a new home.

Switch tie production throughout the country is complicated by additional un-

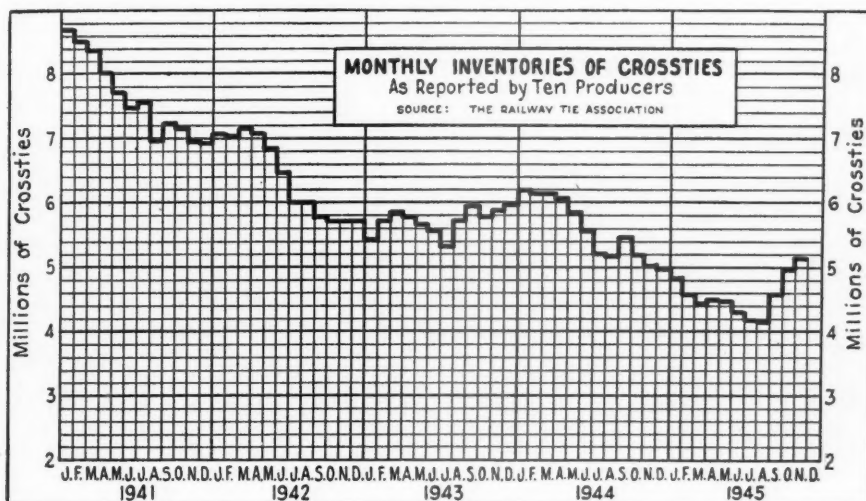
After squeezing through 1945 with barely enough stock to meet 44,770,000 crosstie renewals, a total seven per cent less than the previous year, two per cent below 1943 figures and an eight per cent drop compared with 1942, the railways face urgent tie demands with depleted yard stocks and sagging production throughout most of the country. Four years of intensive utilization of all railway facilities also have built up large requirements of timber, lumber and other forest products that are difficult to fill because of the unprecedented housing shortage and falling mill production caused by contagious labor unrest, absenteeism and a new low in labor efficiency.

favorable factors that becloud the issue and threaten shortages in several species. In the Appalachian territory, for instance, oak switch tie production at \$40 per M f. b. m. has shrunk to barely 10 per cent of order quantities and the downward trend continues. The falling off has been particularly noticeable in lengths of 13 ft. and up due principally to low O. P. A. ceiling prices and the fact that crosstie ceilings plus the allowable

contractor's margin, that lawfully may be added, now favor crossties by an appreciable margin. Also, the larger mills naturally prefer cutting common-dimension plank and timbers at prices substantially higher than the \$40 switch tie ceiling. Some switch ties are coming from the Southern hardwood territory but here again production lags far behind the demand and Southern pine mills naturally are not interested in



Although crosstie production took a spurt in July and August and, as this chart reveals, held up reasonably well in September and October, some producers are skeptical about 1946 prospects



Crosstie inventories reflect the results of increased production and were two per cent greater on November 1, 1945, than on the same date last year

producing switch ties at \$40 when they are flooded with lumber inquiries at much better prices.

Basically, many production problems stem from labor shortages in the woods and at the mills. But, to complicate matters still further, labor difficulties are accentuated at treating plants. Piece-work and hourly rates generally enable workers to earn more than ever before and overtime work offers additional inducements. However, in common with much of the unrest that has prevailed throughout the country during this readjustment period, absenteeism is unusually high and working efficiency has been evaluated at 60 per cent by one prominent manufacturer who finds that 60 man-hours are now required to accomplish the equivalent of 40 man-hours before the war. On some yards where tie loading has been carried on by piece-work with the average rate not less than 5 cents per tie, loaders have earned in 30 hours approximately as much as they normally made in 48. But, even with the new rates as added induc-

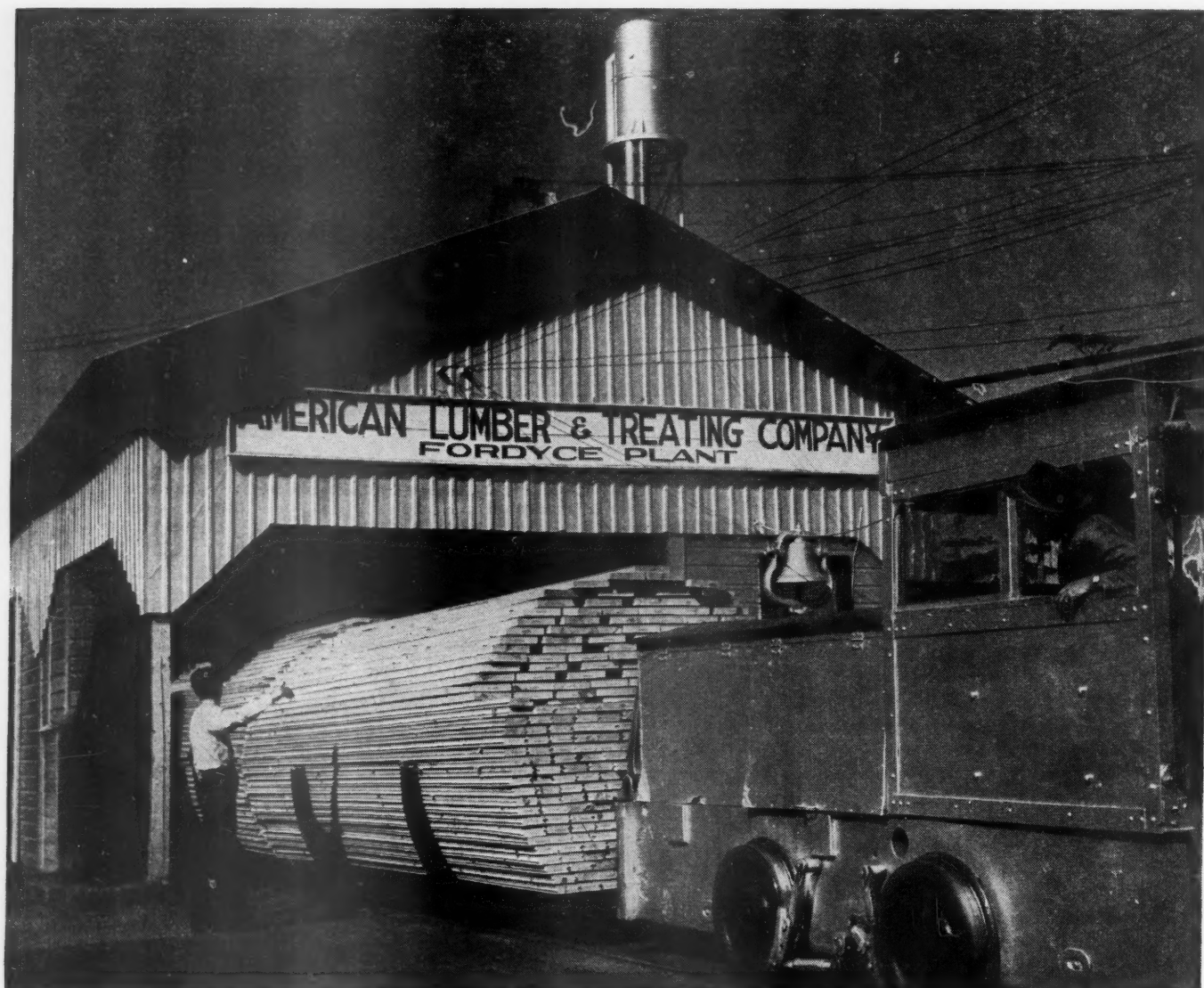
ment, the average loading gang rarely has been working longer than 30 hours a week, thereby limiting shipments and adding to confusion and cost.

All of these complications and more particularly labor problems have added substantially to the railways' annual bill for cross and switch ties. Increased costs within the last few years have added approximately one dollar to the average cost price per treated crosstie delivered to track ready for insertion. Agitation, originated by railway procurement officers, for reduced handling costs, plus the scarcity of tie handlers at treating plants have stimulated the investigation and development of mechanical handling systems to the point that several different machines are now in use for unloading crossties from cars and at least one complete mechanical handling system was placed in service late in 1945 at a treating plant in Georgia. Although it is yet too early to establish definite efficiency ratings for several of these new devices, nevertheless it is apparent that, in some instances at

least, the challenge of devising mechanical methods to reduce production costs has been taken up in earnest and several designs look promising.

Vapor drying unseasoned crossties prior to treatment is another interesting development that passed from the pilot plant stage to commercial production in 1945 at another wood preserving plant in the South. Backed by several years of intensive research and two years' exposure of ties in test track, the new process reduces months of air seasoning to a matter of a few hours in a retort and without the attendant splitting and checking that are characteristic of several species in the course of orthodox methods of seasoning and treatment.

Although Canadian roads experienced largely the same difficulties that prevailed throughout the crosstie industry in this country, evidence at year's end indicates the probability of somewhat earlier relief. Moreover, general conditions and stocks have improved substantially compared with the beginning of 1945, although in some localities pro-



Prospects indicate prolonged demand for railway lumber, a large proportion of which will be treated with preservative and fire-retardant products

duction has fallen off sharply. Advances in tie prices during the year helped production volume in the face of severe competition and on January 1, 1946, tie stocks awaiting treatment were greater than at any time since the outbreak of war in the autumn of 1939.

Shortage of woods and treating plant labor imposed many difficulties during the year, but a perceptible improvement at the plants last fall culminated in the largest total volume of treated forest products ever turned out by Canadian plants. Present trends point to stabilization of labor probably by the end of the first half of 1946. Production prospects are bright in Western Canada although the huge export and domestic demands for both hardwood and softwood lumber in the East threaten to reduce tie production below 1945 levels.

Big Demand for Poles

Principally because of the overly ambitious program proposed for the next few years by the Rural Electrification Authority, poles are likely to be very scarce. Backed with almost unlimited funds, the present R. E. A. program may not only tax the capacity of the wood preserving industry but also threatens a serious depletion of southern pine forests in the Southeast, unless the Forest Service Branch of the Department of Agriculture is successful in its efforts to so balance and extend the proposed program that forests may be maintained on a sustained yield basis. Even with such an effective curtailment, it is anticipated that 1946 pole production will be double the 1945 rate that prevailed prior to the removal of restrictions on pole line construction and that demand for creosoted poles will far outstrip the supply.

Scarcity of labor at treating plants has been one of the main retardants in treated pole production, although the last few weeks have seen some improvement in this respect and it is anticipated that a better labor supply will relieve the situation by midyear. Pole production may be much easier, particularly because pole sizes usually are restricted to a narrow range, the general demand for piles is comparatively small and order sizes tend to complement regular pole sizes. Export demand probably will be strong in both classifications and will add to general competition.

After the relaxation of military demands and governmental restrictions in 1945, the lumber industry was confronted almost immediately with many labor difficulties comprising "slowdowns," general inefficiency, absenteeism and in some areas, the disappearance of a large proportion of deferred wood workers as soon as the draft was eased. Last fall, West Coast strikes closed practically all operations in that

area that were dominated by the A. F. of L. Reliable estimates place the reduction in West Coast operations at better than 60 per cent, because production was limited to C. I. O. and independent mills from September 24 until the settlement of the strike during the first week of December. These and other causes resulted in a decline of almost 13 per cent in the country's total lumber production during the first nine months (latest figures available at the time of writing) compared to the same period last year. September production totogged to 2,196,045 M. f. b. m. which is nearly 18 per cent less than August production and the greatest drop between successive months after the outbreak of war. The decrease was general throughout the country, except for the North Central region, which showed an increase of 2 per cent over August, whereas reductions ranging from 7 to 21 per cent occurred in all other regions. Despite labor troubles in the West, the greatest loss in lumber production occurred in the South where comparable totals dropped 21 per cent. General unsettlement of the industry following the end of the war, unfavorable weather, harvesting activities and labor difficulties were given as basic reasons for the poor showing.

In the face of these conditions there is an extraordinarily heavy demand for forest products for home building and railroad uses that undoubtedly will persist for a prolonged period. No decided price changes were made in ceilings for western softwoods during the year, although the O. P. A. now has under consideration advances for several items as well as eliminating the optional addition of specific paragraphs of standard grading rules whose use, in many instances, may have made for faster deliveries at appreciable increases in cost, but without any compensating advantages of quality. Such practices were the outgrowth of wartime buying and have no place in normal markets, especially insofar as railway lumber requirements are concerned. Incidentally, another source of irritation for domestic buyers is the realization that O. P. A. export ceiling prices are substantially higher than domestic prices for similar grades and hence more attractive to many mills.

Plywood for Car Lining

All West Coast lumber will be scarce for some time and the pinch will continue to be felt particularly in car lining. As a result, more roads are thinking seriously of using plywood. Here again production was seriously curtailed by the recently settled strike which shut off approximately half the production. Consequently the total estimated production for 1945 dropped 9 per cent below 1944

and about 22 per cent below the all-time peak of 1942. However, with the rescinding of plywood's limitation order last August 22, and subsequent wholesale cancellation of government orders and the readjustment of order files at the conclusion of the strike, the clouds have parted somewhat to reveal the promise of a brighter year; especially for railway buyers because their normal grades will also be the popular grades with the mills.

Again, the overall demand undoubtedly will be of such proportions that the supply will seem very short by contrast.

Lumber Industry Losing Men

Falling lumber production throughout a large part of the South and East since V-J Day has been ascribed to many reasons, the majority of which stem from labor trouble. When draft deferment status was eliminated, for instance, more than half the woods workers in some areas decided that their obligations had been met and took vacations forthwith. It has been all too evident that discharged service men are little interested in returning to woods work or lumbering's prevailing wages. Labor unrest in automobile and steel industries has been contagious with resultant increases in absenteeism and steadily declining log and lumber production. Working efficiency also has suffered until it has dropped below even the war-time average of approximately 60 per cent of normal peace-time standards. Slow reconversion, particularly in the automobile and allied industries, has postponed the availability of new trucks, trailers, tires and repair parts for mills so that these necessities are almost as scarce as they were during the war.

The outlook for southern pine structural timbers is poor and probably will continue so for some time. With a preponderance of small mills widely scattered, the tendency has been to cater to the black market and to adopt many sharp practices including the famous "typewriter grades" and the substitution of species. Present price ceilings favor dimension and boards and it is to the advantage of the millman to cut his timber into such items—a practice that is bound to expand particularly if the present price relationship is maintained in view of the unusual demand for housing.

These are present conditions and prospects based on a semblance of O. P. A. lumber prices to hold part of the market somewhat in check. Remove price checks altogether and lumber prices are bound to skyrocket, with little hope of restraining rampant inflation, because of the unprecedented demand for housing and the huge total of untapped savings throughout the entire country.



The heavy passenger traffic was superimposed upon an equally heavy freight traffic

It was with this knowledge that American railroaders grimly set about this additional task superimposed upon their already well-nigh unbearable burdens. They would have accomplished the herculean labor, too, as they had met the numerous other tasks imposed upon them by the war, had not the devastating force of the atomic bombs crashing down on Hiroshima and Nagasaki caused the Nips to yell "Uncle."

Troops Well Handled

All preparations for the abruptly changed conditions were made in record time. After consultation with the military forces and with railway passenger and operating officers, Director Johnson of the Office of Defense Transportation issued a series of orders aimed at clearing the decks for action. Sleeping car runs of less than 450 miles were canceled and the railways were prohibited from accepting reservations more than five days in advance. The withdrawal of sleeping cars from civilian use resulted in the provision of 895 additional cars for military use exclusively.

These measures, plus the ban on conventions, resulted in effective handling of troops between V-E and V-J day, despite the fact that the newspapers, for a time, had a field day with stories of how poor were the accommodations supplied to returning soldiers. Those in position to know, such as the O. D. T. and military officers, realized that the true situation was not being reflected by such stories which, when they had any foundation in fact at all, described troop movements dumped on the railways without warning sufficiently in advance to permit the gathering of proper equipment.

Rationing Impractical

The handling of an average of nearly a million troops in group movements monthly during the 45-month period of the war without rationing the vastly increased civilian travel is sufficient answer to these uninformed critics. Rationing of train travel was proposed early in the war and airplane travel was, of course, actually rationed. A study of the situation revealed, however, that, as far as railway travel was concerned, formal rationing was impracticable, if for no other reason than that it would take thousands of employees who were not available in a time of manpower shortage, to police any rationing system and, even then, the evils of ticket scalping and bribery could not be properly policed. Therefore, despite pres-

And Still They Come

Passenger traffic volume showed little signs of diminishing in the busy year of 1945

By CHARLES LAYNG
Western Editor

WHEN the joyful news of Germany's surrender was broadcast, it brought happiness to every American, but to railway officers and employees charged with handling passenger traffic, it also brought headaches. It meant that the already inadequate supply of passenger equipment would now be called upon to handle what promised to

be the greatest mass migration in history—the movement of millions of Troops from the European to the Pacific theatre of operations. No leisurely proceeding this—every minute saved in getting men from the Atlantic to the Pacific ports by rail could well have meant the saving of many American lives by shortening the war with Japan.

sure from certain government circles, train travel was never rationed during the entire war period. There was, under the nature of things, a sort of unofficial rationing. For one thing, certain trains became so crowded with standees that there was no possibility of packing another passenger aboard. Also, several railways established reservation systems for coach travel which eliminated standees, the trains being booked to the limit of their seating capacity after which the sale of tickets was stopped.

However, during the war, we were a nation on the move, civilians and military personnel alike. The complete cessation of solicitation for passengers, the constant appeals to the public—on the part of the railways, the O. D. T. and government authorities, including the President—to stay off trains had little apparent effect. The American citizen insisted upon his right to go some place when he felt like it. Even the discomforts of war-time travel failed to deter him; the only thing that ever stopped

him was the actual physical impossibility of getting on trains.

No Breathing Spell

When, after 45 months, peace returned, the urgency of transporting soldiers on their way to the battle fronts disappeared, but there was no breathing spell for the railways. A new urgency developed—the desire of relatives and sweethearts to have the boys returned home. The Army yielded to this vast public pressure and thousands of boys arrived daily at hundreds of ports on the Atlantic and Pacific coasts, all requiring rail transport. The pressure has increased, if anything, and there is no let-up in sight until mid-summer.

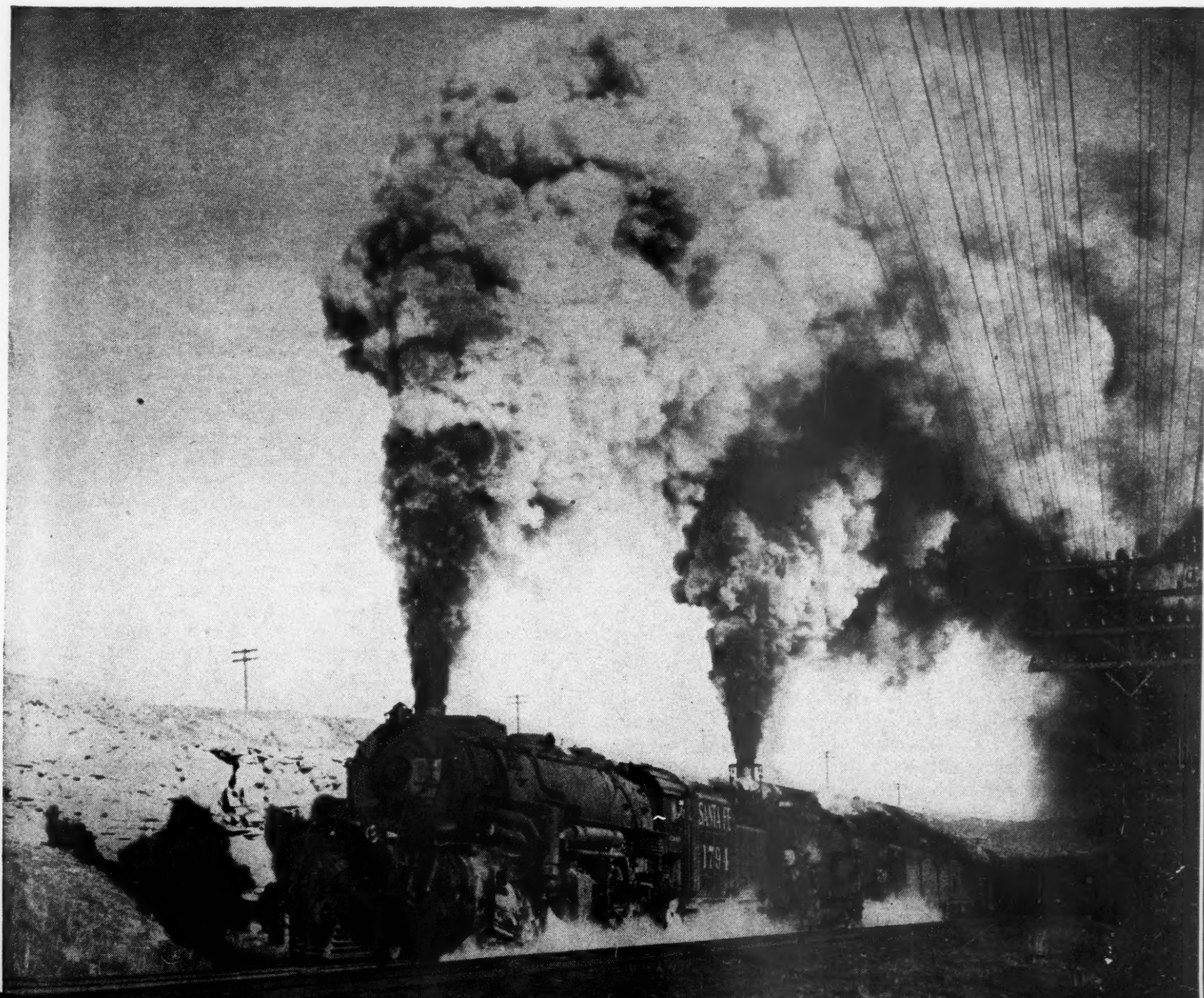
The railways were prepared to handle the scheduled number of troops which were to arrive at Pacific ports during December. However, the estimates supplied by the military authorities were so far under the actual total that all the efforts of the railways were unavailing in keeping the ports currently clear of troops, and many thousand returning veterans were compelled to stay on shipboard for three or four days after their

The 1945 passenger traffic year was unusual in many respects, even for a war year. Drastic measures were necessary to take care of the indicated movement of thousands of troops from the European to the Pacific theater, in transcontinental rail hauls across the country. Even after the cessation of hostilities in the Pacific, the problem remained acute as the desire to get the boys home as soon as possible has placed a terrific burden on the railways. Normal conditions as to the civilian passenger traffic are not expected to return before June 1, 1946.

Troop trains frequently required double heading

arrival, while other thousands were held in various camps until equipment could be found in which to move them.

This situation was brought about by the fact that the railways had little or no advance warning as to the veritable





avalanche of returning veterans that would be dumped upon them. For a few weeks in December the western railways averaged 50 special troop train movements daily from the Coast, which was far in excess of the estimate. Regular trains were also devoted almost entirely to troop movements for several days; for example, for one week's period, the Southern Pacific averaged 94 per cent troops and only 6 per cent civilians on its regular trains.

The heavy troop movements, plus an unusual upsurge in civilian travel prior to the Christmas holidays, resulted in the worst passenger traffic jam in the history of the western railways in the week before Christmas. Following the unprecedented pre-Christmas jam, however, civilian travel dropped off abruptly and more normal conditions prevailed in the last few days of the year.

Troop movements of nearly a million a month are expected to last through June, 1946. Meanwhile, the situation is further complicated by movements of relatives to the ports to greet the boys, by large groups of prisoners of war moving to the ports, by people taking long-deferred vacations, by mass exoduses from war-plant areas on the part of discharged workers and by enhanced travel on the part of business men as a part of reconversion necessities. Then, too, previously postponed conventions are now being held in large numbers, contributing materially to increased travel. When the further factor is considered of strikes and other reconversion difficulties in the automobile industry, thus delaying the production of private automobiles — the railways' principal competitors for passenger traffic—it is apparent that little or no slackening of the load may be expected for months.

The streamliners handled many passengers in critical areas

For a time it was thought that automobile tires might be a limiting factor also, but, while the supply will not meet the demand for another four months at least, the over-all situation has improved. The production in 1945 is estimated at 28,000,000 tires, as compared with 50,000,000 in 1941. In 1946 the tire industry expects a peak production of 66,000,000 casings.

At a meeting of the A. A. R. in Chicago on November 30, most of the executives' time was spent in discussing ways and means for handling the forthcoming rush of traffic during the months to come. It was estimated that, during December, 1945, about 530,000 men would arrive on the Pacific Coast and 490,000 on the Atlantic. Those returning from the Pacific present a specially difficult problem, since nine-tenths of them require long trips to reach home.

Pleasing the Passenger

Already, the elimination of food rationing is having its effect in an appreciable improvement in dining car meals. There is little noticeable difference in overcrowded dining car conditions, however. Securing reservations is also just about as tough a job as it ever was. As the manpower shortage has abated somewhat, coaches are noticeably cleaner. The efforts of the railways to teach their employees post-war courtesy are showing some results. By autumn of 1946 many of the new passenger cars now on order will have been delivered.

Great improvements over the lowered standards of war-time in all of these factors are an essential if passenger traffic in large volume is to be held on the rails. The majority of war-time passengers were docile, uncomplaining creatures, but this will not last forever. In fact, a recent opinion survey of the Association of American Railroads indicates clearly that the reaction has already set in and that complaints are mounting. The year 1946 is the most critical the railways have ever had to face, so far as the future of their passenger business is concerned. There will be a most direct relationship between what they are able to do to please the passengers this year and their future passenger revenues.

The Pullman Problem

The question of who is to operate sleeping cars loomed large in the passenger picture throughout 1945. A detailed history of this entire question was given in the Passenger Progress annual of the *Railway Age* of November 17, beginning on page 831. Since then the four groups which offered to purchase the Pullman sleeping car facilities on November 5 filed briefs in the United States district court in Philadelphia and a fifth brief was filed by Pullman, Inc., supporting the railways' offer.

The railways' brief claimed that their proposal is the only one which is in furtherance of the public interest. The brief also stated that the contract is exactly what the court contemplated when it ordered the interests disposed of and that it is the only proposal of all that satisfies the court's anti-trust purpose. The other briefs all contended that their proponents' offer was the most suitable and some of them attacked the railways' plan as monopolistic.

On December 6 the Department of Justice filed a statement with the court, to the effect that none of the proposals were acceptable to the Department of Justice except that of Otis & Company.

Following oral argument on these briefs, the court gave its approval to acceptance by Pullman of the railroads' offer for purchase of the sleeping car business. On December 26 the court extended until March 31 the time when the *status quo* of operation of sleeping cars by Pullman might continue (replacing a January 1 "deadline"). At the time of going to press there had been no indication that the Justice Department or the unsuccessful bidders intended to appeal the case to the Supreme Court. Meanwhile, sleeping cars are being operated by Pullman as heretofore and are piling up record mileages as they shuttle back and forth under their capacity loads of military and civilian travel.

From War to Peace in Freight Traffic

By **CHARLES LAYNG**
Western Editor



Western railways were called upon to handle much oil to the Pacific Coast

Whatever else may be said about 1945, the statement that it was an unique freight traffic year would go unchallenged. The problems of handling the traffic were unprecedented in their scope and variety. Storms and floods were encountered to an unusual degree. The cessation of hostilities brought about an amelioration of the persistent demand during the war for open-top cars. Because of record harvests and other factors, however, the box car situation remains tight and heavier loading and efficient car utilization are still a vital necessity.

THE roar of a succession of blizzards blanketing the northeastern states ushered in the year of 1945 and the elements continued to be on Hitler's and Hirohito's side for nearly three months thereafter. Storm after storm buried railway facilities over a wide area and

the unprecedented weather harassed precisely those railways which were most concerned in the movement of vital war freight for the final and victorious war effort in Europe. The effects, in tying up urgently needed freight cars, were felt throughout the United States and a whole series of embargoes were necessary, extending as far west as Chicago. This phenomenon was repeated to a certain extent in mid-December, 1945, when record snowstorms in the Buffalo area caused a situation requiring temporary embargoes on freight destined to that area.

Hardly had the effects of the severe winter been eliminated from the national transportation scene when another problem confronted the railways. V-E day required the railways to halt many shipments en route. The demand for gondolas and flat cars became somewhat less pressing, but box cars continued to be short in many areas.

The bumper crop of winter wheat added still another transportation prob-

lem to the western railways. V-J day brought some relief, but by then unprecedented harvests of all sorts were demanding cars and still more cars. The increased production of civilian goods was reflected in a continuing increase in the loading of less-than-carload freight. Surplus war materials began pouring back from Europe and, to a lesser extent, from the Pacific. In order to handle the unprecedented movement of troops returning through the Pacific ports, which averaged 50 special troop trains a day alone for several days in December, it was necessary to divert freight power to haul some of these trains. This, plus the fact that such heavy passenger movements interfered with freight train movements, resulted in congestions on many of the western lines. Freight schedules were seriously disrupted in many cases and it was necessary to set out loaded freight cars in yards and sidings throughout the West. In general, the freight traffic year of 1945 was unprecedented, even

for a war year, in the multiplicity and variety of problems the railways were called upon to solve.

Traffic Volume; Car Shortage

Because of the world-shaking events that occurred and their immediate relation to rail transportation in this country, the freight traffic year of 1945 divides itself naturally into three periods. Between January 1 and May 8, when Germany quit, the war was in full blast on all fronts, with attendant full-scale war traffic on the railways. From May 8 to August 14, when Japan gave up, it was a one-front war, but the effect on traffic was not great; for example, the decrease in carloadings in July, 1945, as compared with July, 1944, was only 2.9 per cent.

After hostilities ceased in August, there was a sharp falling off in traffic; for example, the decreases in freight traffic in August, September and October, 1945, as compared with the same months in 1944, were 11.8, 14.7 and 18.7 per cent respectively. Some relief from the pressure was experienced by reason of the decline in the average haul per car, and by the elimination of the special handling that was required on certain war materials, which frequently necessitated the operation of special trains far under normal tonnage ratings. Nonetheless, civilian traffic continued to increase; the normally heavy autumn peacetime traffic did not level off as usual about November 1, but continued until nearly Christmas.

While the carloadings declined, this decrease was entirely in the loading of gondola, flat, stock and tank cars, while box car loading continued at the same high level of the war years. Gondola and flat cars were, of course, in tremendous demand for moving war material, while the tank cars were used in the all-rail oil movement to the East, both of which movements have now virtually ceased.

It has been difficult to explain to shippers why box cars were still tight despite decreased traffic, but the Car Service division of the A. A. R. has had representatives at each shippers advisory board meeting to explain the situation. The supply of box cars promises to continue to give trouble during 1946, particularly as the various orders of the O. D. T. as to heavier loading have been or soon will be suspended. The attitude of the shippers was expressed by E. G. Plowman, vice-president, traffic, United States Steel Corporation, before the Eastern Traffic Executives Association at a recent hearing in Chicago. Mr. Plowman stated that the railways must place in effect some plan to insure a continuation of heavy loading practices. The carriers have already taken steps by proposing so-called in-

centive rates for higher carload minima on a wide range of commodities. Hearings to thresh out the advantages or disadvantages of all these proposals are now being held in various cities and the shippers are being given ample opportunity to voice their opinions.

The Winter Storms

The severe winter weather in the Northeast had an unprecedented effect on the whole transportation picture, since so much war traffic was en route to Europe that many thousands of cars became snarled in the mess and it took a long time to extricate them. The railways everywhere were operating at so near capacity that the delicate balance between adequate transportation and a potential breakdown was seriously disturbed. It was the aim of the O. D. T. and the railways to get war traffic through and this was done, at the expense of delaying civilian traffic. At times embargoes were in effect against all civilian freight except vitally essential items. To assist, the I. C. C. also issued a service order requiring the railways in the affected territory to re-route freight as circumstances directed, regardless of shippers' routing orders.

Meanwhile, the embargoes were rapidly extended until they covered all of the territory east of the line of the Alton and the Mississippi rivers and north of the Ohio and Potomac rivers. Such embargoes not only prohibited the loading of civilian freight within this territory, but also loading at other points for destinations within the territory. Some passenger trains were temporarily withdrawn to ease the situation. Snow-fighting equipment was used on an unprecedented scale and the manpower shortage was eased by the furloughing of thousands of troops to work at clearing the railways. These conditions lasted from the first of the year until well into March.

The Grain Movement

The winter wheat harvest began in the Southwest in June with fewer cars on hand at the loading points than at any other time in history. In fact, there were only a few hundred empties on hand as compared with the thousands normally available. This was caused by the great demand for Class A box cars for war material and also because the effects of the winter storms in the dislocation of cars were still being felt. There was a heated exchange of correspondence and public statements between Colonel Johnson and representatives of the grain trade on the subject, the latter claiming that they were faced with ruination. However, through O. D. T. orders prohibiting the misuse of cars; through the permit system

which prevented the loading of cars to elevators that were full; and through the efforts of the Car Service division in getting empties from the East and South into the loading territory, the grain was handled. The movement was not as smooth as either the railways or the grain trade would have desired, but under the existing conditions it was a remarkable achievement.

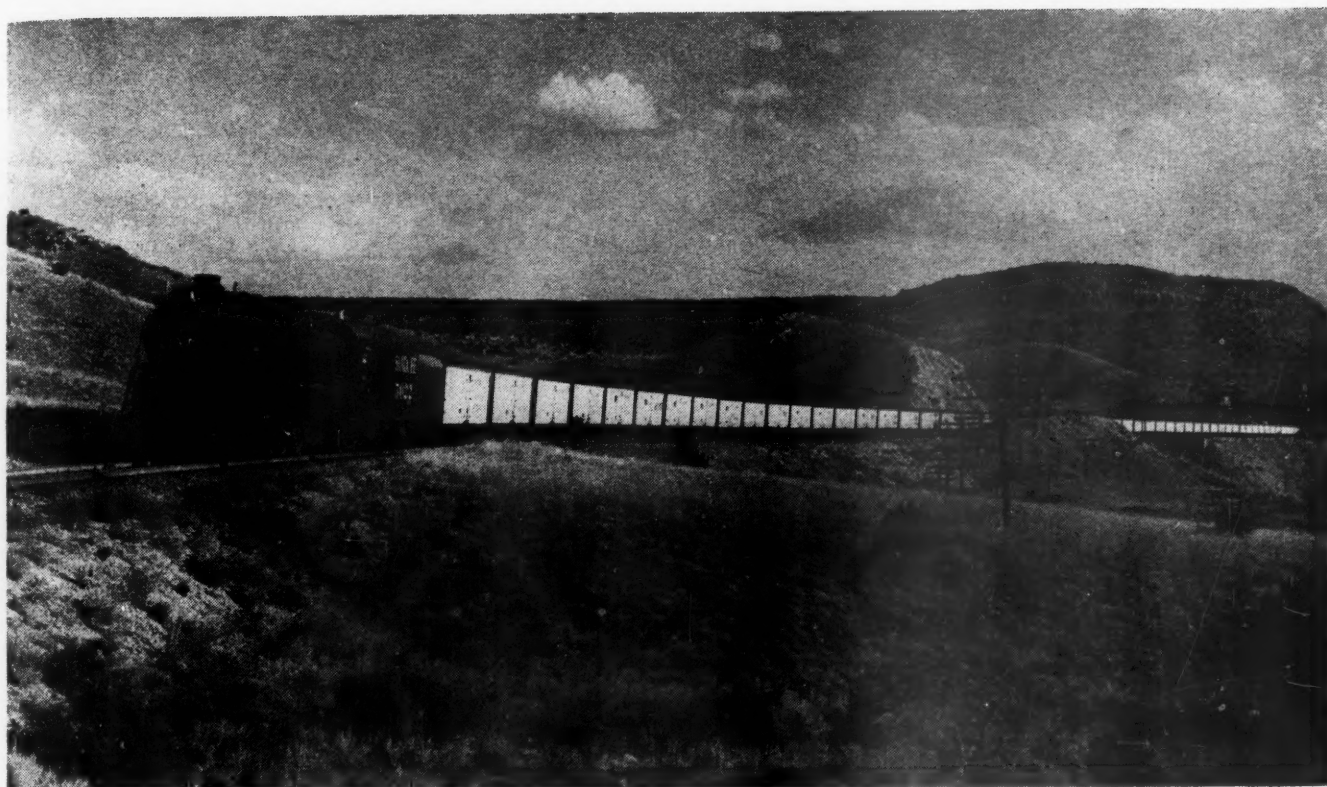
The magnitude of the task of handling last year's bumper crops is indicated by the record. The production of food and feed grains amounted to 6½ billion bushels, an increase of 274 million bushels, of 4.4 per cent over the previous record yields of 1944. It represented an increase of 1,700 million bushels, or 35 per cent, over the average yield of the 10-year period 1934-43. The production of food grains alone was two million tons greater in 1945 than 1944. In addition, the tobacco, peanut and hops crops in 1945 were 6.3 per cent larger than in 1944 and 40 per cent greater than the previous 10-year average. Flax and soy bean crops were also larger than in any previous year.

The movement of grain requires high quality box cars and this complicates the situation. Box cars in poorer condition than they ever have been in modern railway history, and there are fewer high-class cars available. The demands of the war years have been so heavy that it was necessary to keep every unit in service, if at all possible, and this fact, plus the shortage of car repair men, is now producing a situation in which the number of unserviceable cars is increasing every day, while there are many cars in service which, except for the continued heavy demands, would also be on the rip tracks.

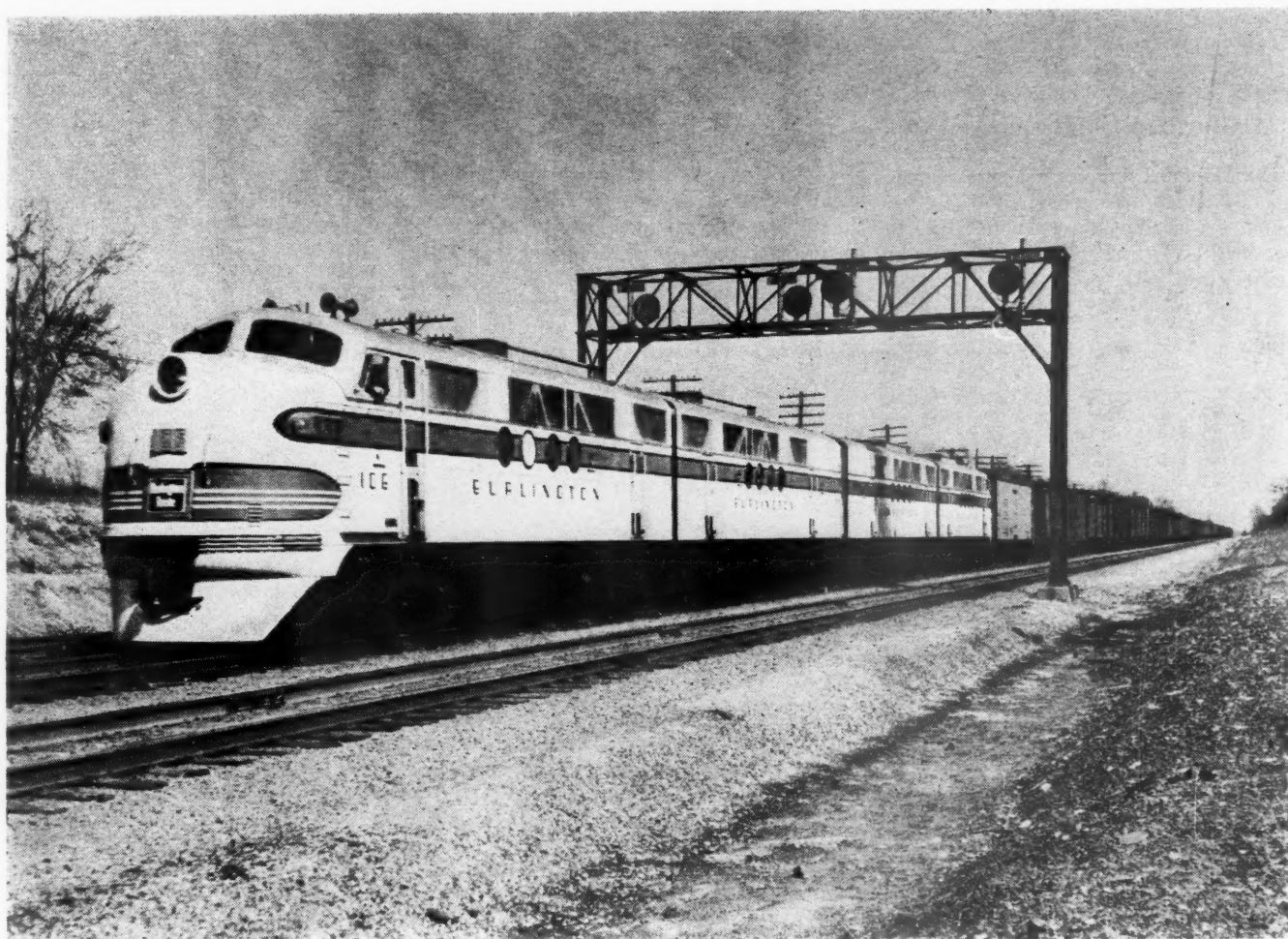
Beginning on November 1, the Car Service division set up an arrangement for returning cars from the East and South to the western roads which had immediate results. By the end of November some 9,000 cars per week were so supplied and this was stepped up to 2,000 cars a day in early December. The principal shortage of box cars was in the spring wheat territory of the Central West and the Northwest, where hundreds of grain elevators were closed because of car shortages. The car supply program had the effect of materially reducing this number of closed elevators by December 1.

The Movement West

The end of the war in Europe did not result in additional freight being shipped to the Pacific Coast for the Far Eastern war theatre as greatly increased traffic westbound had started in January, 1945, and reached its peak in May, 1945. The daily average westward loads moved to the Pacific Coast for selected months were as follows:



The railways contributed much toward feeding the nation by handling thousands of cars of perishable traffic



Diesel-electric freight locomotives hauled much war-time traffic in 1945

Month	Daily Average
1943	
March	3,452 cars
October	3,893 "
1944	
March	4,000 "
October	4,580 "
1945	
March	4,857 "
April	4,772 "
May	5,065 "
June	5,005 "
July	4,895 "
August	4,175 "
September	2,936 "
October	2,941 "

The traffic fluctuation on the western roads was reflected in the over-all traffic picture, except that a peak occurred in March as well as May. Revenue ton-miles for the railways as a whole rose from 55,462,959,000 in February, 1945, to 64,424,041,000 in March; declined to 61,406,982,000 in April and rose again to 64,218,052,000 in May. Since that date, freight traffic has been declining.

The daily average movement of cars both into and out of California, Oregon and Washington averaged 8,301 daily in March, 1943, which increased to 12,756 in July, 1945, the peak month. At the same time, extra passenger and mixed trains through the 10 key gateways serving the west coast increased from an average of 31 to an average of 52 per day. Despite this increase in traffic, the western railways reduced cars set off short of destination or terminal from an average of 1,055 cars per day in 1943 to 192 cars per day in 1944, and to no cars per day in 1945.

A Glorified Chief Dispatcher

This remarkable record was accomplished under the general control of an office set up in Chicago under the direction of W. F. Kirk, who served as a joint representative of the Interstate

Commerce Commission, the Office of Defense Transportation and the Western Association of Railway Executives. This office supervised the movement of cars to the Coast, keeping a close check on the availability of the various routes and rerouting freight to avoid congested terminals. In all, during the life of the office between March, 1943, and October, 1945, a total of 316 "Kirk orders" rerouting freight, were issued. During this time, the number of loaded cars moving through the 10 gateways selected as measuring points amounted to 7,061,933 cars, of which 335,000 were rerouted or diverted; 225,000 to by-pass overloaded terminals, 25,000 because of line interruptions and 85,000 to avoid congestion on certain lines because of unequal distribution.

There was no port congestion such as that which marred transportation in World War I and the west coast ports were no exception. Unloading there increased from 30,448 cars in February, 1943, to a peak of 82,859 cars in May, 1945, and the bank of off-shore loads was never permitted to accumulate beyond good working capacity.

Notwithstanding the perplexing problems which they faced, chief among which was the reversal of direction of the traffic flow from eastbound to westbound, scarcity of materials and manpower, and inability to secure additional rolling stock, the seven railways serving the West Coast made tremendous strides during the war.

On these seven roads (comparing the eight-month average of 1945 with the entire year of 1940), with freight train miles showing an increase of only 15.5 per cent, the average monthly gross ton-miles were increased from 17½

million to 33¾ million, an increase of 91.6 per cent. Train loads increased from 2,075 tons in 1940 to 2,545 tons in 1945. Gross ton-miles per train hour increased from a monthly average of 37,818 in 1940 to 41,665 in 1945, while loaded car miles increased from a monthly average of 277,329,000 to 509,821,000. The increase in total car miles per month was 304,347,000 or 69.1 per cent.

It was not necessary to divert traffic from any mid-western railway because of over-load, although, several times, diversions were necessary from such lines because of congestions on western connections. The traffic flow was interrupted several times in 1945 by floods in the Missouri and Mississippi valleys and Mr. Kirk's office was of material assistance in establishing temporary routes and rerouting cars, particularly as to the symbol oil trains. During the heavy oil movement, it was necessary to divert 3,127 symbol oil trains, containing 156,379 carloads, because of traffic interruptions on their regular routes.

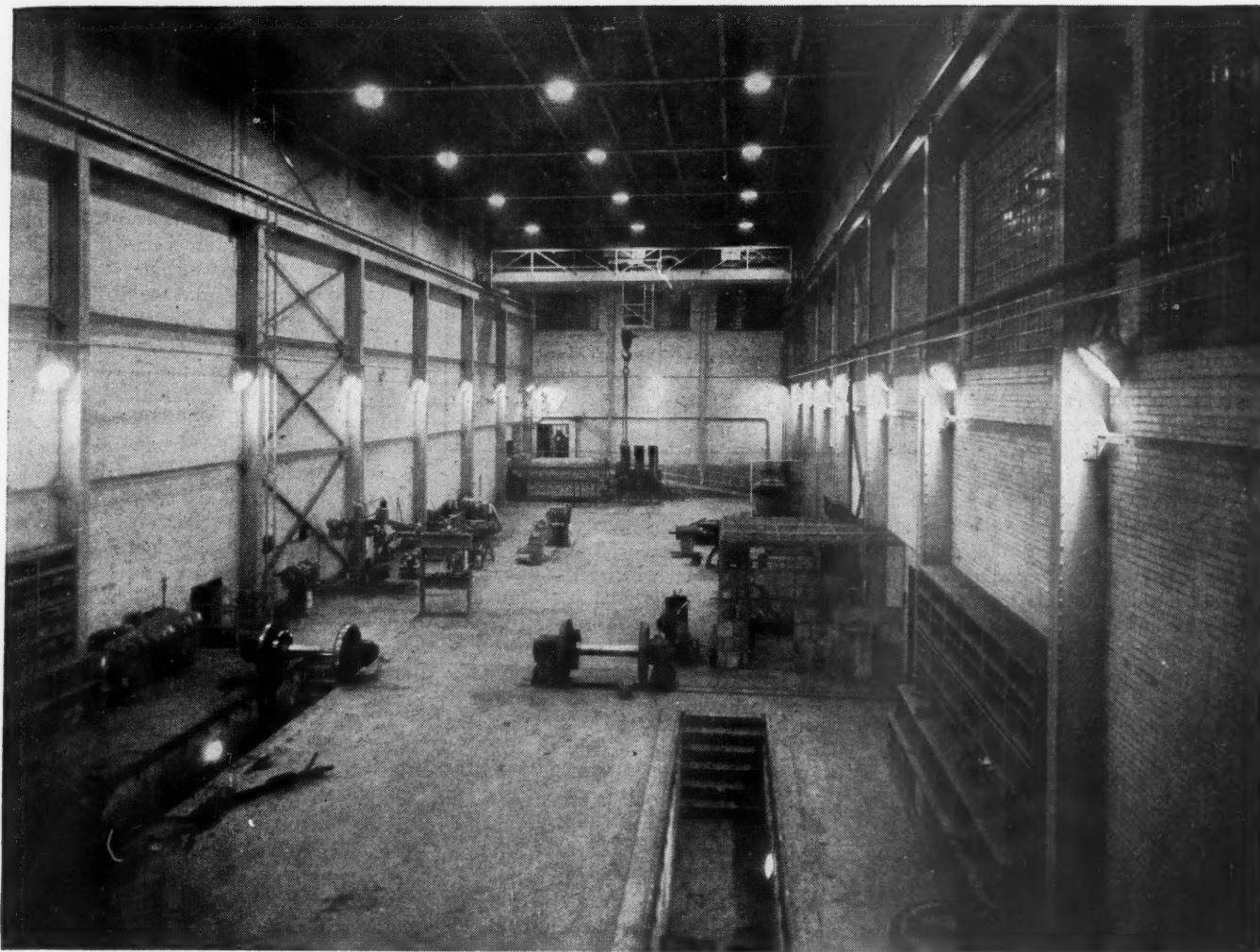
The total movement of loads and empties to and from the Pacific Coast for selected war months, is given in the accompanying table.

Total Movement—Loads and Empties to and from the Pacific Coast for Selected Months

Month	Cars		
	Eastward	Westward	Total
1943			
March	174,852	166,173	341,025
October	184,874	179,108	363,982
1944			
March	192,719	185,211	377,930
October	209,547	204,775	414,322
1945			
March	166,567	163,050	329,617
July	192,056	181,793	373,849
October	137,408	126,699	264,107

The Western railroads had to be operated at near capacity to take care of the load





Interior of a Diesel repair shop lighted with high intensity mercury vapor units

More Things Being Done Electrically

FUNDAMENTALLY the electrical industry is in the business of generating and applying power. Within the industry, it is not important whether the source is falling water, steam, internal-combustion engines, gas turbines or atomic energy. It remains largely for electrical devices to transmit the power to the place where it is needed and to supply convenient means for its use.

To a small extent railroads are competitors of the utilities in power generation, but their primary interest is application, whether it is traction, operation of machine tools, welding, heating, lighting, air conditioning or the utilization of the infinitesimal amounts which are sent through space to maintain radio communication. In recent years these basic applications have broadened until, as one electrical foreman put it, "I hope to live until we have as many electricians

A. G. OEHLER
Associate Editor

as we have mechanics." This may come to pass, since in addition to improvements of existing applications, new developments such as those in electronics serve to broaden the field.

Engineers of two major railroads have made studies of extensive additions to existing electrifications. Such studies serve to show what can be accomplished physically, but it is difficult by this means to show operating economies sufficient to warrant the necessary major capital expenditure. It is rather for the management to determine what can be done with this more adequate tool to improve its traffic, and since the cost must be

amortized over a period of years, it is not an easy thing to do.

In other countries where fuel is at a premium, the use of electric locomotives is in no doubt. During the year American manufacturers have received orders for 42 electric locomotives from South America. These include 26 freight and passenger units for the Sorocabana, 6 passenger and 6 switching for the Paulista and 6 freight and passenger for the Central of Brazil. In this country, it seems probable that one electrification will be abandoned. This is the section on the Boston & Maine which was installed to dispose of a bad tunnel condition rather than as a means of handling heavy traffic. Diesel-electric locomotives now used by that road are able to negotiate the tunnel without difficulty.

On the other hand, the Virginian has ordered from the General Electric Com-

pany four motor-generator type electric locomotives which will be the first locomotives of any type to carry a million pounds on the drivers. Designed for heavy coal-haulage over the Allegheny mountains, they will operate from 11,000-volt, 25-cycle, single-phase power and will be constructed as two-cab units, with all weight on a total of 16 driving axles. The Great Northern has also ordered from General Electric motor-generator type locomotives to use on its electrified Cascade Tunnel section. There will be two, and they bear the distinction of being the largest single-cab locomotives ever built. They will have a knuckle-to-knuckle length of about 100 ft. and will weigh 360 tons, with all weight on drivers.

Contemporary or competitive with the electric locomotive, and in various stages of development, are new and improved Diesel-electric, reciprocating steam, steam-turbine, steam-electric and gas-turbine locomotives. The T-1 four-cylinder steam locomotives of the Pennsylvania, for example, possess operating characteristics similar to those of the Pennsylvania's GG-1 electric locomotives. While not directly comparable, it is interesting to note that the T-1 has a maximum horsepower rating of 6,552, while the GG-1's continuous and maximum ratings are 4,850 and 8,500. The T-1's have been in mainline service between Harrisburg, Pa., and Chicago.

The newcomers in the road Diesel field are the 3,000-hp. locomotive just completed by the Baldwin Locomotive

Whether the locomotive power is taken from an overhead wire or developed by a Diesel engine, steam turbine, or gas turbine with electric drive, it is still essentially an electric locomotive—This position is being made more secure by reduction of electrical equipment weights and higher permissible motor and generator operating temperatures—Four-cylinder steam and geared-steam-turbine locomotives are offering effective new competition.

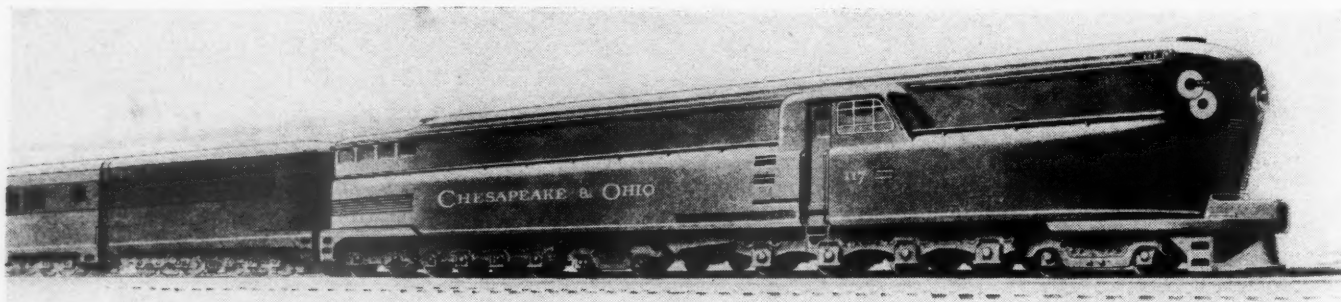
Works for the Seaboard and the 6,000-hp. locomotive produced by Fairbanks Morse & Company for the Union Pacific. The Seaboard locomotive will weigh 577,200 lb. and will be the first Diesel with running gear of the steam locomotive type. It is a single-cab unit with a 2-D+D-2 wheel arrangement. The Union Pacific locomotive consists of three single-engine units, each weighing 160 tons, all on six axles. The Electro-Motive Division, General Motors Corporation, has increased the capacity of its freight locomotives to 1,500 hp. per cab unit. Units of this capacity will be employed in the ten 6,000-hp. locomotives recently ordered by the Pennsylvania.

Early in 1945 work was started on three coal-burning turbine-electric locomotives for the Chesapeake & Ohio. They will develop 6,000 hp. and will have a top speed in excess of 100 m.p.h. A steam turbine driving a 4,000-kw. generator will supply power to a motor on each driving axle. The next unit to be built is expected to develop 7,000 hp.

There is much difference of opinion as to when the gas-turbine locomotive will become important. One man, closely associated with the industry, says that such locomotives will be competing for a place in the railroad field in two years, and another, equally familiar with developments, says it will be twenty years before a satisfactory locomotive will be worked out.

To the electrical industry, whether it is electric, Diesel-electric, steam-turbine-electric, or gas-turbine-electric, it is in all cases an electric locomotive with or without a prime mover. For many years the wish has been expressed for a mechanical transmission, but in horsepower above 250 little progress has been made.

The total horsepower (continuous rating) of electric locomotives in service on Class I railroads is about 2,125,000. The Diesel-electric locomotives now in service total 4,300,000; almost twice that for the electrics. Since the Diesels must have generators as well as motors, the locomotive machine horsepower involved is already almost four times that of electric locomotives. A large electrification must have power plant capacity equal



How the Chesapeake & Ohio 6,000-hp. steam-turbine-electric locomotive will look when completed



Artist's conception of one of the motor generator-type locomotives being built for the Virginian

to about one-third of its total locomotive rating.

Diesel-Electric Maintenance

There are now in operation a sufficient number and variety of electrical repair shops to allow any newcomers in the field a good opportunity to find an example of one suited to his specific requirements. Practices extend all the way from that in which the user has his dipping and baking done in outside shops to a shop which is essentially similar to a manufacturing plant.

One practice on which there seems to be no agreement is the use of traveling Diesel-electric maintainers. Some roads look upon them as an unnecessary expense while others who employ them state they have not only paid for themselves in avoiding delays and the prevention of costly repairs, but that they can take over as much as 40 per cent of the maintenance work which would otherwise have to be done in the shops.

New insulating materials are available which permit higher-temperature operation, and it is expected that as their use becomes better understood they will have a marked effect in reducing electrical maintenance costs.

Train Communication

Train communication is passing from the field of experimentation to that of application. Developments are covered in another article in this issue devoted entirely to the subject. For the benefit of those who have to do with power supply, particularly as it applies to cabooses, it should be said that developments in this field are lagging behind those in the relatively new fields of radio and inductive communication.

Insofar as relations between the railroads and the Federal Communications Commission are concerned, things have been moving smoothly. One of the last restraints to general application of train communication was removed by the Commission on November 14 when it released proposed rules and regulations for governing railroad radio service. The rules were to go into effect if the railroads offered no objections within 20 days. One minor change was requested which involved the use of channels assigned to train communication by "communications common carriers." The railroads asked that this clause be deleted. The communications carriers agreed, and at an oral hearing held in Washington, December 20, the Commission granted the railroads' request. Much credit is due both to the Commission and to the railroads' representatives for having worked out this problem so effectively, and with so little friction.

Thus, all obstacles to the making of installations seem to be removed except

that the Interstate Commerce Commission has expressed its approval of a bill which would authorize the I. C. C. to require railroads to install and maintain wayside and train communication systems conforming to standards prescribed by it. Consideration of this bill might for a time at least have a retarding influence on the making of installations.

General Lighting

New lighting units which have been developed are the "Slimline" and "Circline" fluorescent lamps. The Slimline lamps are made in four lengths, 42, 64, 72 and 96 in., the two shorter lamps being $\frac{3}{4}$ in. in diameter and the longer ones having a diameter of 1 in. They are instant-starting and have a life range of from 2,800 to 6,000 hours, depending upon frequency of starting. Efficiencies are high, ranging from 56 to 63 lumens per watt. The Circline lamps are fluorescent hot-cathode lamps made in the form of circles, respectively, $8\frac{1}{2}$, 12 and 16 in. in diameter. None of these lamps is yet available commercially, but it is expected they will be in production, with the necessary sockets, shortly after the first of the year.

Some remarkable results indicating the value of good shop lighting were referred to in the report of the Committee on Illumination of the Electrical Section, Engineering Division, A. A. R. It stated that by increasing the light level in an electric locomotive repair shop, "from a rather spotty 3 to 5 foot-candles to a well-distributed 20 foot-candles," the output of locomotives per day was increased 10 per cent, locomotives returned to the shop by inspectors because of poor workmanship were decreased 80 per cent, reportable accidents were reduced 43 per cent and non-reportable accidents were decreased 41 per cent.

The value of lighting grade crossings has been emphasized by the experience of the Niagara Junction Railway. This railroad has 38 miles of track within the city limits of Niagara Falls, N. Y. During the four and one-half years prior to lighting, night accidents at nine city and four private grade crossings averaged six a year. In the seven years since the crossings were lighted with sodium lights this average dropped to 1.3 a year, although the train movement doubled during the last three of the seven years.

Germicidal lamps which destroy air-borne bacteria have been found highly effective in the reduction of meat spoilage in railroad commissaries. The Union Pacific reports monthly savings of \$500 for meats and \$150 to \$400 for fruits and vegetables at its Omaha, Neb., commissary.

New applications of lighting were, of course, limited during the war, but studies have been made for office, shop, yard and particularly enginehouse lighting

and many improved installations can be expected.

Electrical Equipment

Electric power serves all branches of the railroad industry and it is not possible to write a label which will name all applications. A stationary Diesel power plant on the Rock Island has shown remarkable savings and it would appear that there may be a number of places where similar plants may be used to advantage. New types of space heaters and resistance cable have been adapted effectively to dispose of the time-honored problem of coal freezing in chutes.

All motor applications are subject to improvement by improved insulating materials and new controls will be of benefit especially to applications requiring variable-speed drive.

Now that they are again available, the use of static condensers will undoubtedly be continued to reduce copper requirements, improve voltage regulation and avoid low power factor penalties.

Passenger Cars

About 1,700 passenger cars are now on order. Equipment for these cars will include air conditioning, most of which will derive its power from axle-driven or propane engine-driven generators. Diesel engine drives are also being developed for this purpose.

There is evident among users a strong inclination to use voltages higher than 32. One manufacturer and one railroad are definitely committed to 64 volts and others are going to 110.

Most of the lighting will probably be fluorescent and there are available new types of vibrating inverters and voltage boosters to compete with the motor-alternators now most generally used to supply the fluorescent lighting systems. Lighting will be much improved.

Air conditioning equipment and controls are available which will avoid undue cycling with wide swings in humidity and which will provide a uniformity of conditions in all cars in a train.

Centrifugal type air cleaners and electrostatic filters will compete with the oil film and throw-away types now in general use.

Electric water coolers will continue to replace ice.

A modification of the tank-gun stabilizer developed during the war will become available for improving the riding quality of cars.

An all-electric diner is in process of construction, which, in addition to being an innovation, should serve as a laboratory for determining not only the value of electric cooking and refrigeration, but also the feasibility of producing, on a car, the necessary amount of power.

Scientific Developments Aid Signaling

in
1945

By JOHN H. DUNN
Signal and Communications Editor

War-time postponements of new signaling and replacements may be a blessing because roads can benefit by installing modern systems, the recently developed coded track circuits and electronic carrier current

NOW that the war is finished, materials and apparatus should soon be available for the railroads to modernize existing signaling facilities as well as to install new systems designed to improve train performance and to reduce operating expenses, thereby assisting the railroads in meeting competition by reducing overall time between terminals as well as keeping passenger fares and freight rates on a



In c.t.c. territory on the Kansas City Southern



The Rock Island installed station-to-station automatic block with no line wires

favorable basis compared with other means of transportation.

During the preparedness program of 1941 and nearly four years of war, the scarcity of materials has of necessity limited signaling construction primarily to those projects which were required to relieve congestion on sections of railroad which were handling heavy war-time traffic. Prior to the war, during the ten depression years, 1930 to 1940, the installation of new signaling was limited to those projects which would effect savings that represented a large return on the investment. Thus, for approximately the past 14 years, the construction of many signaling projects, as well as the extensive replacement of old signal facilities, have been postponed from year to year, so that an enormous backlog of such work has now accumulated.

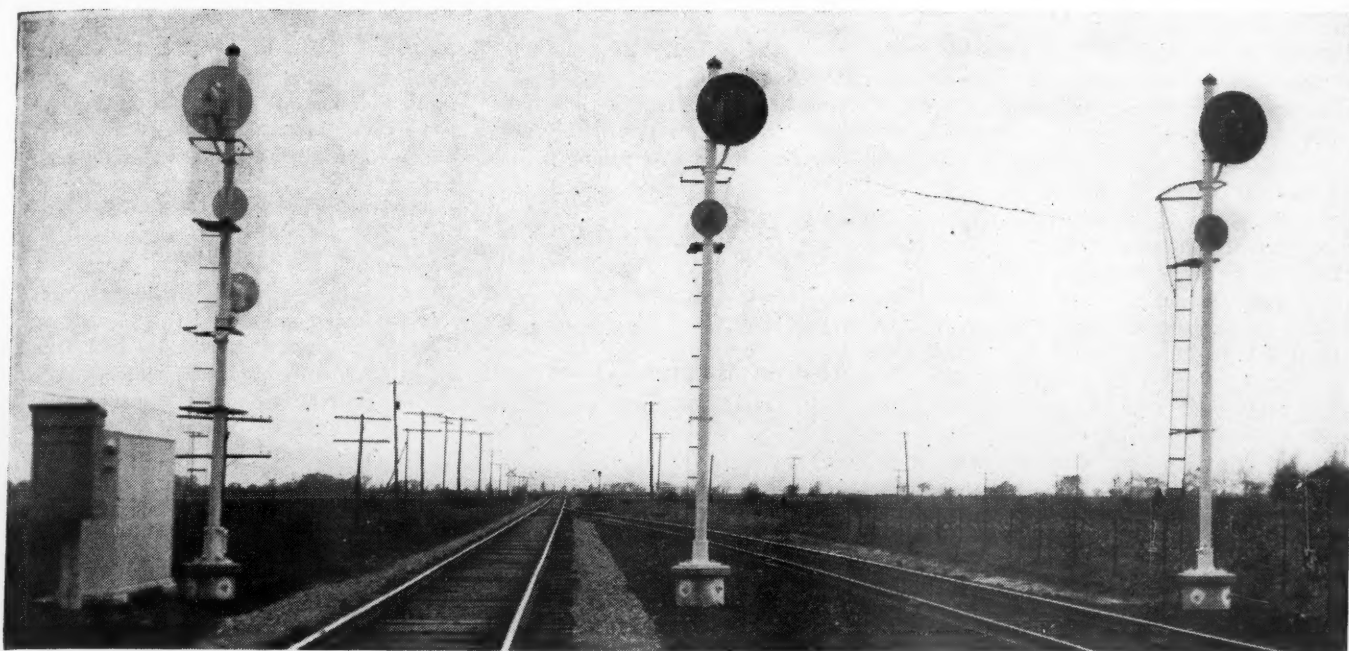
In the last year before the war, that is as of January 1, 1941, the railroads of the United States had semaphore automatic block signals in service on 53,825 miles of track. At least 20 years ago nearly all railroads ceased to install semaphores and adopted light signals for all new projects. Therefore, the semaphore signals on a large percentage of the 53,825 miles are more than 20 years old and many have seen 30 to 40 years of service. When worn beyond reasonable limits these old semaphores not only are expensive to maintain and operate but they cause failures which result in needless train stops. The war added four more years of intensive wear and tear to the borrowed time on the life of these signals. In

most instances, therefore, these old semaphores should be replaced with light type signals as promptly as materials can be secured.

Similarly much other old signaling equipment, such as relays, wiring and instrument cases, is in need of replacement. Therefore, typical modernization programs of automatic signaling in some instances include not only new signals, but also complete new control systems with modern coded track circuit apparatus, thereby eliminating or minimizing the number of line wires for control circuits.

Increases in train speeds, especially of freight trains, result in an increase in the train stopping distance to more than the length of the blocks on many automatic block signal territories. Some roads have rearranged the signals as required, but others have added overlaps so that two signals to the rear of a train display the red aspects, while other roads changed the controls so that two signals in succession display the yellow aspect in approach to one displaying the red. Both these temporary expedients are not good signaling practice, and they result in a reduction of track capacity, thereby introducing train delays. Thus on many territories the old automatic block signaling must be revised to conform with the requirement of modern train speeds.

In some instances the remedy is to relocate the signals for longer blocks, but where this would space trains too far apart, some roads are installing signals with four or more aspects. As compared with three-aspect signal, the



Signals at the end of a siding on the Wabash manual block remote control

four-aspect signaling permits the use of shorter blocks thereby providing a better flexibility of the spacing between following trains, which permits trains to keep moving rather than reducing speed or stopping unnecessarily. Four-aspect signals are especially of benefit where trains are closing up when approaching terminals or junctions.

Regardless of the types of signals and aspects to be used, there is much rehabilitation of automatic signaling that has now been postponed too long and, therefore, should be done as soon as possible.

The postponement of signaling proj-

The railroads, which are making extensive improvements in track and are purchasing new locomotives in order to increase train speeds, must also modernize their signal and interlocking facilities so that the number of train stops can be minimized, and trains can be kept moving a greater percentage of the time at the speeds for which the new tracks and locomotives are designed. In the majority of instances, the modernization of existing signaling or the installation of new systems will not only improve train performance but also effect economies in train operation which will more than offset the expenditures for the new signaling facilities.

ects due to the war should prove to be a blessing in disguise because the railroads can now benefit by installing modern signal systems as well as recently developed materials and apparatus. For example, on many roads a first consideration on single-track projects is to provide not only protection but also train operation by signal indication, thus superseding the antiquated system of authorizing train movements by timetable and train orders. On a single-track section of railroad handling heavy to medium volumes of traffic, the installation of centralized traffic control, including power switch machines at sidings and signals for authorizing train movements, will save an average of about one minute for each freight train mile, and, therefore, projects of this nature will easily pay for themselves as has been proven on more than 7,000 miles of such installations now in service. These facts were well understood by many railroads, as well as by the War Production Board and other government agencies, so that C. T. C. projects on busy single-track lines were pushed to completion as a part of the war transportation program; approximately 5,000 track miles of C. T. C. being constructed during the four war years, 1942 and 1945, inclusive. This total compares with 2,703 miles which were so equipped from the time C. T. C. was developed in 1927 until January 1, 1942.

Many railroads would like to have installed C. T. C. on various sections of their lines during the war but materials were not available. Now that this situation is being corrected, detailed studies will reveal locations where

C. T. C. will not only expedite train movements but also make savings in operating expenses to pay for the signaling.

The failure to make such studies, or to analyze the results after they are made, has led some railroads to rebuild existing automatic block in kind or to install new automatic block which necessitates the continued use of the antiquated timetable and train order method of authorizing train movements. On the other hand, some roads are well informed of the advantage of authorizing train movements by signal indication and they are determined to include these features in new or rebuilt single track signaling systems in spite of various difficulties which may be encountered in cutting the cloth to fit.

Modernizing Helps Milwaukee

The Chicago, Milwaukee, St. Paul & Pacific has 51 miles of single track between Laredo, Mo., and Polo on the line between Chicago and Kansas City on which the traffic is of medium volume; four passenger trains, about six through freights, a local freight and several extra freights daily, totaling from 12 to 18 trains daily. No signaling was in service on this 51 miles, and based on the character of the line and volume of traffic, the first conclusion was that ordinary automatic block signaling was about all that could be justified. At this juncture modern science and perseverance stepped in to plan and install centralized traffic control at a total cost not a great deal more than the cost of conventional absolute permissive block signaling with the ordinary ar-

rangements of intermediate signals and controlled by conventional track circuits and two-wire line wire circuits.

The first important item was to get all parties concerned to agree to eliminate the sidings which would not be needed with C.T.C. operation. Based on the number of trains and time intervals between trains it was practicable to eliminate many of the intermediate automatic signals which would have been required for head-on protection if straight automatic block had been installed. The next item was to develop a new and unique scheme of normally-deenergized coded track circuits which obviated the use of line wires for local automatic controls of signals, as well as a-c. power distribution wires between sidings, thereby eliminating line wire and pole line construction. The C.T.C. code line was superimposed on existing telephone line circuits. In brief, the management approved the C.T.C. project rather than that for straight automatic block only, and the C.T.C. was completed and placed in service early in 1945. This installation was described in an article in the *Railway Age* of June 2.

Electronics were applied to solve an important problem in this project. The dispatcher for this division is located at Ottumwa, Iowa, which is 104 miles from Laredo, Mo., the nearest end of the 51 miles of C.T.C. By using electronic equipment, known as carrier current, it was practical to superimpose the C.T.C. control codes on existing line wires between Laredo and Ottumwa so that the control machine was located in the dis-

patcher's office at Ottumwa which was considered to be a decided advantage for numerous reasons.

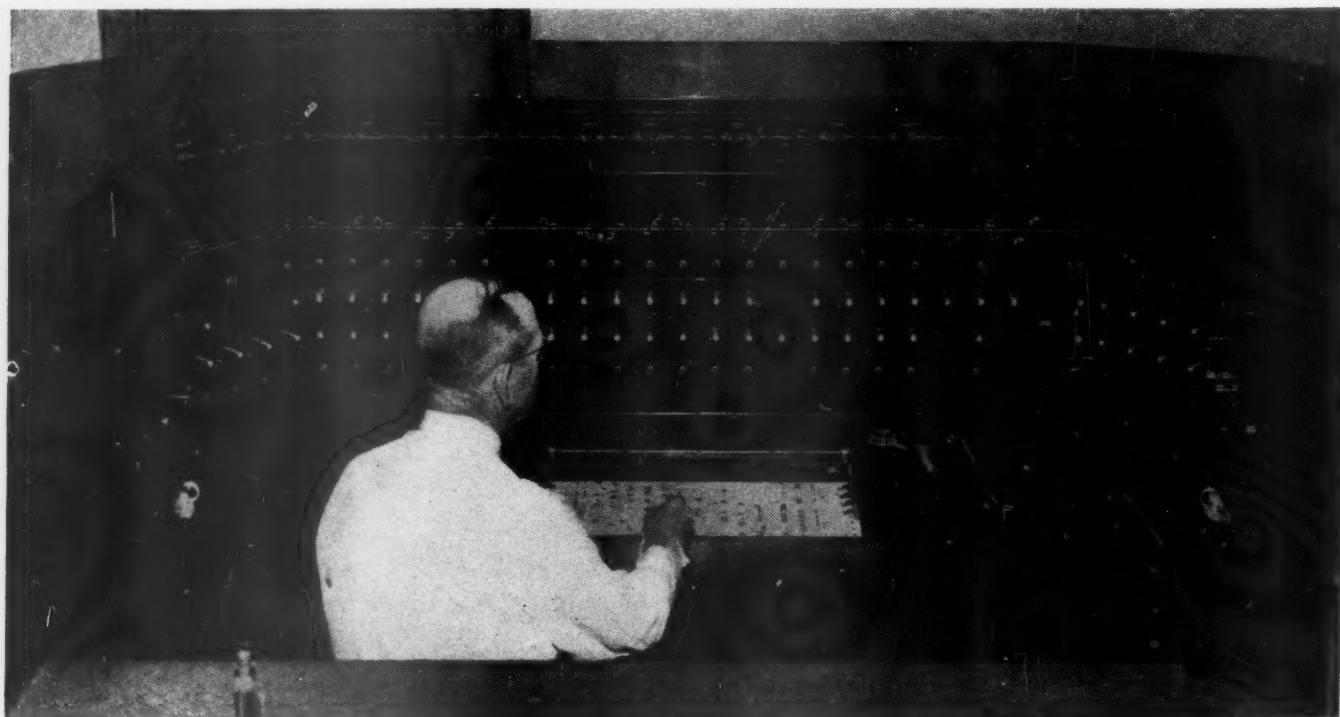
Also on the Denver & Salt Lake, centralized traffic control, including normally-deenergized track circuits, is just now being completed on 128 miles of single track between Denver, Colo., and Orestod, which is a part of the Moffat Tunnel route of the Denver & Rio Grande Western between Denver and Salt Lake City.

Also on Multiple Track

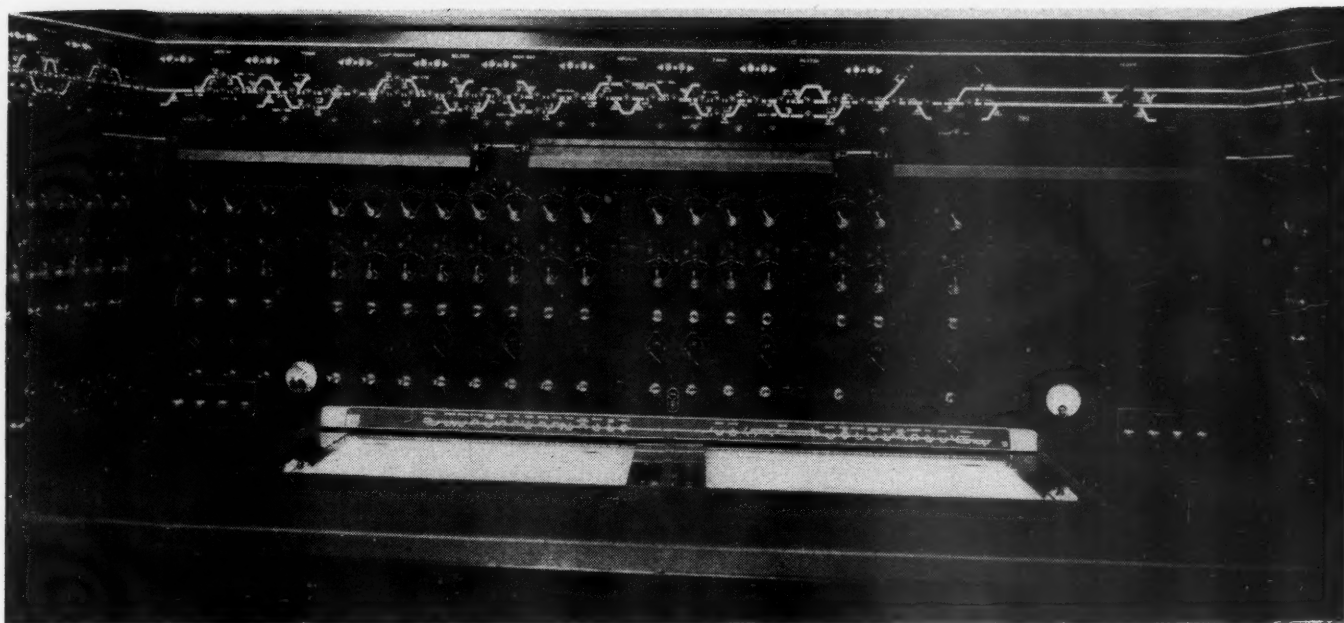
On double track lines some roads have installed C.T.C. so that trains may be operated in both directions on both tracks and thereby an idle section of track can be used to run a train around a slower train of the same direction thus keeping both trains moving rather than one wasting time waiting on a siding. On sections of three-track, for example, the middle track may be signaled for both directions so that two tracks may be used "inbound" in the morning and two tracks "outbound" in the evening. On portions of some railroads where all the main track crossovers are in interlockings already, new signals and traffic locking have to be added to run trains in the direction reverse from normal when desirable to increase the track capacity in one direction or the other to handle peak traffic. For example, the Pennsylvania has installed this arrangement on much of the multiple-track territory between New York and Washington, and this was an important aid in handling war-time traffic.

The Wabash has about 210 miles of secondary main line between Decatur, Ill., and Moberly, Mo., which has a lighter volume of traffic than on the section of the Milwaukee discussed above, but even so, the Wabash was convinced that a signal system including means for authorizing train movements by signals, controlled by the dispatcher, was preferable to ordinary automatic block. Therefore, the signal engineer and operating officers of the railroad devised an arrangement of signals and aspects which is known as manual-block remote-control, in which signals at the ends of the sidings authorize trains to take sidings, leave siding, or move to next siding, the block being from siding to siding without intermediate automatic signals to permit following moves in the station-to-station blocks. Also in this system the hand-throw switch stands are continued in service the same as previously. Thus the Wabash has complete track circuit protection, broken rail protection and a check on the position of switch the same as in automatic block, and also the train movements are authorized by signals controlled by the dispatcher, without train orders. This system was installed on 34.7 miles between Decatur and Starne, Ill., in 1944, and on 39 miles between Moberly, Mo., and Clapper in 1945, as was explained in detail in an article in the *Railway Age* of July 28. Other projects are under way so that the mileage in service and under construction totals 134 miles.

On the Chicago, Rock Island & Pacific line, west from Chicago to Den-



The c.t.c. machine at Lincoln, Neb., on the Burlington, controls a complete subdivision of 100 miles



One machine controls 116 miles of c.t.c. through the Feather River Canyon on the Western Pacific

ver and Colorado Springs, there is 492 miles of single track between Omaha, Neb. (Albright), and Limon, Colo., which handles a comparatively light traffic compared with other portions of this railroad. However, the schedules include the Rocky Mountain Rocket passenger trains as well as some fast through freight trains. Heretofore no signal protection was in service on this territory, and, therefore, the primary need was for an automatic block system to include complete track circuits for protection against collisions as well as to check for broken rails and the position of switches. On account of the long mileage, the character of the line and volume of traffic, only a limited expenditure could be authorized for the desired signal protection.

In this case, necessity was the mother of invention; the Rock Island signal engineer and his staff planned a continuous track circuit controlled signal system with blocks extending from siding to siding, no intermediate signals as such being provided to permit trains to follow one another in a station-to-station block. Furthermore, the Rock Island signal staff, in co-operation with the manufacturer, devised a new and novel scheme of using coded track circuits to control single-track automatic signals without line wire control circuits. The long station-to-station blocks reduced the number of signals, and the new circuits eliminated line wire and pole line construction, so that the cost of the new signaling is considered to be in proper relationship with the volume of traffic and the funds available for providing protection. The new system is now in service on 110 miles between Albright, Neb., and Fairbury, Neb., and the project is being pushed west-

ward as fast as materials and construction forces are available.

On other sections of the Rock Island which handle heavier traffic, centralized traffic control is being installed and this system can be superimposed on the Colorado route if the number of trains increase to require it.

New Interlockings for Old

In modern interlockings the locking is accomplished by interconnections of circuits, rather than by the previous use of mechanical locking between levers and by lever locks. The new circuit schemes permit the use of panel type control machines with miniature non-interlocked levers or buttons. One man seated at such a panel can easily control a large layout or what was previously two or more interlockings. Furthermore, the line-ups can be changed more quickly and train time is saved because one man has control of a larger area, thus obviating communications between two or more offices. One of the last large projects of this nature planned before the war was at the union passenger station in Birmingham, Ala., where two old electric interlockings with conventional control machines were replaced with new switch machines and signals, all controlled from one panel machine. At numerous other locations there are two or more old interlockings that could be modernized and controlled from one new machine, thereby improving train operations and effecting economies.

During the war the rationing of gasoline resulted in a reduction in highway traffic, and on this basis the War Production Board did not allocate new materials for crossing protection projects

except for new crossings in the vicinity of military camps or war industries. Now that gasoline is available in any quantity desired, highway traffic will increase beyond previous records. Therefore, new installations of automatically controlled highway crossing protection, and reconstruction of existing facilities, will be needed at many crossings. Consideration will be given to the installation of automatically-controlled gates at crossings of double-track railroads with highways on which there is heavy traffic. Prior to the war, protection was being installed at approximately 1,100 crossings annually, and programs of about the same number of crossings will be required annually for several years if accidents are to be held to a minimum.

Car Retarders in More Yards

When planning for reductions in over-all time for freight traffic between remote cities, an important item is to reduce the time which ordinarily is lost by freight cars when waiting in yards to be classified. From 1924, when car retarders were developed, up to the beginning of the war, these retarders with power switches were installed in about 45 large yards. Such facilities permit yards to be operated at peak capacity day and night, regardless of adverse weather and, therefore, incoming traffic is classified in a constant flow, thereby eliminating congestion in receiving yards. Now that materials are again available, these power switches and retarders should be installed in several more existing yards as well as in other gravity yards to be built. In addition to reducing delays to cars, these facilities make savings in operating expenses to justify the investment.

Equipment Buying Sets the Pace

By C. MILES BURPEE

Purchasing & Stores Department Editor

DESPITE the general turmoil and apparent lack of national unity, despite strikes and threats of strikes, despite major differences between management and labor in this transition period from war to peace, there comes the realization that all basic factors of peace-time economy are favorable. Although production is declining, national income is following suit and unemployment is increasing, these conditions are not alarming and economists predict that the transition will be largely completed in 1946 and possibly as early as mid-year.

Our country itself has not been ravaged by war. We have a population of almost 140,000,000, which represents an increase of 34,000,000 people since the armistice of 1918. Individual savings exceed \$115 billion and business savings have been estimated to be equally as large. A tremendous demand has been built up for both durable and nondurable goods of almost every kind. Building experts predict the erection of at least 350,000 homes in 1946 and building equivalent to an average of 720,000 houses annually for the next five years.

All of these factors point to correspondingly heavy freight traffic. Despite any predictions to the contrary, the railways that transported 278,000,000 tons, comprising nearly 92 per cent of the Army's freight during the entire period from December 7, 1941, through June 30, 1945, will continue to handle the great bulk of the nation's freight in peace.

Record Equipment Order

The New York Central's mid-December, \$34,000,000 order for 22 streamlined, light-weight, deluxe sleeping car trains comprising 420 cars, in addition to 300 passenger cars for daylight service already under construction, brought that road's order now on the books for passenger train equipment up to \$56,000,000 and represents the equivalent of 52 new streamliners. Reported to be the largest single order for railway passenger equipment ever placed in the nation's history, it comes as striking evidence of what may be expected during the next five years as rapidly moving railway programs get under way to modernize equipment, road and facilities to meet competitive freight and passenger transportation with even more dependable and efficient service.

Class I railways estimate that their

All indices point to high level railway buying throughout 1946. With a population of almost 140,000,000, individual savings of 115 billions and business savings equally as large, a tremendous demand for goods of all kinds and a building boom in the making, the railways are girding for the greatest modernization in history. Handicapped with civilian status and severest restrictions of equipment, materials and manpower, they proved their national worth in war. Now they are preparing to meet the severest competition yet, with speeding improvement in all their facilities to provide swifter and even more dependable service.

capital expenditures for the first three post-war years will aggregate nearly \$1,636 millions, according to a compilation of replies to a questionnaire by the I. C. C.'s Bureau of Transport Economics and Statistics. The estimates are based primarily on the premise that average annual net railway operating income during that period will amount to \$998 millions or the equivalent of that of 1941. The carriers estimate that of the total prospective expenditures, approximately \$754 millions are slated for road and \$882 millions for equipment.

Although the report goes on to point out the carriers' declaration that accumulations from earnings and other sources during the war period or earlier will play a relatively insignificant part in these expenditures during the first three post-war years, it is significant that as of August 1, 1945, the excess of current assets of Class I roads over their current liabilities amounted to nearly \$1,925 millions compared with \$799 millions on December 31, 1941. The railways estimate that approximately 8 per cent of the expenditures will come from accumulations prior to the post-war period, 63 per cent will be derived from post-war accumulations and that the remainder will be borrowed.

Railway purchases of equipment, materials, supplies and fuel in 1945 topped similar expenditures for 1929 by 10 per cent and exceeded those of each year since that time. The 1945 total included \$1,041 millions for material and

supplies received from manufacturers, \$550 millions for fuel deliveries and orders placed during the year for equipment comprised \$115 millions for new freight train cars, \$108 millions for new passenger train cars and \$97 millions for new locomotives. Materials and supplies received from manufacturers in 1945 topped those of 1941 by 28 per cent, they exceeded those of 1929 by 8 per cent and also were greater than for any year since that time.

Steel Highly Involved

In the light of the threatened steel strike and the general industrial uncertainty prevailing throughout the country, the outlook for iron and steel products is complex, to say the least. One of the deans of railway purchasing, in discussing the procurement of railway equipment and its complementary steel products, declared: "The situation is more involved than at any time in my forty years' association with purchases and stores work." A buyer for a prominent manufacturer of equipment corroborated that statement by saying, "Never have I experienced such difficulty in obtaining materials to meet our customers' demands."

The output of such products as cast steel truck side frames, truck bolsters, coupler yokes and castings for freight cars; couplers for freight and passenger cars, locomotives and tenders; coupler yokes for passenger cars; locomotive castings and truck castings for locomotive tenders and heavy capacity freight cars has been limited to 65 to 70 per cent of normal plant capacity principally because of labor shortages. A perceptible improvement in the situation has been evident since the first part of November, although a scarcity of skilled and semi-skilled personnel still prevails.

Manufacturers report that railways have not been placing orders as far in advance and deliveries in the last quarter were being met fairly promptly on a 90-day basis; however, as this is being written, labor turmoil and uncertainty preclude all except mere speculation as to delivery dates. If by chance the contemplated steel strike should be settled early and with comparatively little interruption to production, 1946 deliveries probably will average 120 days for the first half. Rolled steel wheels and steel tires for locomotives have been coming through in from five to six months. Probably among the tightest

items for building programs, steel wheels and axles will be slow because of the tremendous demand although deliveries should be adequate for repairs. Draft gears for repairs generally are being delivered from manufacturers stocks and orders are co-ordinated to meet car building schedules. Many purchasing officers report that deliveries of journal bearings, brake shoes and malleable iron castings have been running nip and tuck with consumption.

Deliveries of wrought iron products have been good but mounting demands, particularly for smaller sizes of pipe, suggest the wisdom of anticipating requirements well in advance. Although production of some specific products may be out of balance temporarily, even to the extent of being reflected in deliveries, the over-all picture is good and barring unusual labor difficulties production should keep pace with almost any demands.

Rails and Accessories Tight

Apart from any consideration of a steel strike or its effects, it is apparent that all railways may not be able to get all of the rails they would like for 1946, although a goodly supply, estimated at 1,800,000 or 2,000,000 tons, is in the cards if there is an early settlement of labor problems. The situation is complicated by an accumulated backlog of orders and an exceptionally heavy demand for the first quarter and in fact all of 1946. With the elimination of governmental production control it has been necessary for rolling mills to establish schedules of their own which, in many

instances, have resulted in substantial reductions on standing orders.

Practically the same situation prevails with respect to special trackwork and track fastenings. Backlogs of unfilled orders for spring frogs, complete switches and manganese crossings represent up to 14 months' production. Production capacities for bolted frogs, manganese frogs, switch points, manganese guard rails and adjustable rail braces are reportedly sold out for from six to nine months. One manufacturer, for instance, reports a backlog of unfilled orders equal to more than six months' production at wartime production rates and the equivalent of a full year's output prior to the war. Generally, trackwork manufacturers are bedeviled by labor "slow-downs" that have cut production so effectively that little relief can be anticipated until a definite wage settlement has been reached.

Because of shortages of malleable castings and several grades of iron castings, largely caused by restrictive O. P. A. ceilings and aggravated by higher wage demands, the production of many lines of pumps and machinery have been held up. Although the delivery of locomotive specialties has been retarded principally because of the shortage of skilled labor and inability to secure parts, decided improvements have been evident and deliveries have been restored to fairly reasonable schedules.

Machine tool deliveries undoubtedly will be influenced by strikes in the automotive field, and the volume of foreign business that is anticipated as soon as loans are worked out for Russia and

China. The probabilities are that deliveries will range from four to five months for the greater part of the year. Electrical equipment, appliances and accessories are gradually becoming easier but, because reconversion still is affected by contract termination and the time interval necessary to accumulate raw materials and to begin the manufacture of peacetime products, intervals between placing orders and shipments have been running from a few weeks to nearly two years, depending upon the items involved. Consequently, the greater the degree of anticipation the better; promptness in placing orders bears an important relationship to deliveries.

Need More Handling Equipment

Material handling equipment was in particularly heavy demand by the railways last year when the pinch of labor shortage led to much more extensive use of power trucks and hoists particularly by stores, mechanical, freight, passenger and baggage departments. Introduced in many instances purely as an expedient, the new equipment has taught railway officers many lessons of efficient and faster handling. Reasonably good deliveries seem assured and some models are being shipped in 30 days. Buying probably will run well ahead of 1945.

By reason of the inadequacy of raw materials and the unprecedented demand for electric storage batteries by the armed services during the war, railway supplies were strictly limited. Although some raw materials are still inadequate



In addition to large demands for roadway materials of all kinds brighter prospects are in sight for many types of signaling apparatus because new projects will be free from war-time restrictions

the situation is clearing and it is anticipated that 1946 production will run well ahead of pre-war years. However, some time will be required to stabilize delivery schedules and readjust to normal delivery periods.

Purchases of maintenance of way work equipment amounted to \$17,000,000 in 1945 and a *Railway Age* survey indicates that 1946 buying will outstrip last year's. Motor car deliveries in most models range from 45 to 60 days, although other maintenance of way work equipment, such as weed burners, may in some instances be secured in much shorter time with some deliveries from stock and others in 30 days. Portable air compressors of standard designs are available for 30 to 60 days delivery, although special models built to individual railway specifications require more time, with shipments ranging from four to five months. Incidentally, at least one compressor manufacturer promises distinctly new developments in both crawler and self-propelled rail-car types.

Locomotive fire brick have been relatively easy throughout the war and since, principally because raw materials were plentiful and occasional embarrassments resulted from the scarcity of labor which probably passed its peak last October. With gradual improvement and the return of experienced brick makers the outlook for prompt deliveries is good and no difficulties are anticipated in supplying demands.

Better Paints Are Coming

The paint industry is hoping for appreciable improvements within the first six months, although at present the delivery of some of the raw materials is slower than during the war. Titanium pigments, used extensively for high quality station paints and lacquers, are particularly scarce. One paint company reports that its fourth quarter allotment of titanium was restricted to one-third of its requirements. The titanium industry is attempting to increase production but demand is so great that little relief is expected in 1946. Lead pigment shortages are being overtaken and the white lead industry soon will be back on a full pre-war production basis. After stocks of linseed and flaxseed oil dropped to critically low levels, a timely increase in 1945 domestic flaxseed production and substantial shipments from Argentina promise improvement for the paint industry which has been operating with 75 per cent of 1940-41 consumption.

Lack of uniformity and poor quality of raw materials are still embarrassing manufacturers of quality paints and lacquers for railway finishes and in many instances deliveries of raw materials are on a "take-it-or-leave-it" basis, without recourse. Under such circumstances,

variations in quality and lack of uniformity in the finished product are difficult to explain to railway customers. However, these difficulties may be cleared up within the next six months.

Signaling Will Expand

Brighter prospects are in view for railway signaling apparatus. High-volume production is almost a certainty and delivery time will be cut by reason of better availability of labor and improved manufacturing methods that were developed during the war. Slow deliveries of some components, such as small electric motors and other electrical apparatus, complicate the situation and it may take some little time to iron out these difficulties. Contrary to war-time practice, when the manufacture of signaling apparatus was restricted largely to repair parts and new equipment was limited to W. P. B.-approved projects for key roads carrying very heavy war traffic, 1946 production will be expanded to include all phases of signaling.

No longer will new projects be restricted to limited installations of centralized traffic control and car retarder systems because of their ability to expedite traffic movements with a minimum consumption of critical materials. Many programmed signaling installations, designed to increase operating efficiency, but which had to be shelved during the war, are being dusted off and revamped for early action as essential to the reduction of train schedules in the face of intensive competition in both freight and passenger transportation. Plans to speed up terminal and yard operations will call for the installation of car retarders, communication systems and other facilities. The whole field of train communication is being opened up and important installations are expected. Protective systems for highway grade crossings undoubtedly will also be among the classifications that are due for further extensive expansion. As in all other fields the optimistic outlook for the entire signaling industry must be tempered by due consideration of wage and labor disputes which might introduce serious repercussions if they result in prolonged production stoppage.

Roads Seek Better Coal

Many railway procurement officers are frankly outspoken about the poor quality of the coal their roads have been receiving and point to a number of causes, including large export orders, that have led to continued carelessness in the preparation of coal consigned to railways. The purchasing agent of a road that now is using some 600 carloads of coal daily, while commending the program of basic research that recently has been undertaken in conjunction with bitumi-

nous coal, declared that dealers and coal companies might better get down to brass tacks by really studying the needs of their customers and attaining a basic understanding of railway requirements to provide the necessary equipment and supervision to deliver the kind of coal that is required for efficient firing. Another procurement officer added, "At no time during 1945 was there an abundance of high grade locomotive fuel and the going was pretty rugged." Similar complaints are heard from Canada where one railway officer sums up the situation in these few apt words: "The quality of coal deteriorated further in 1945 and we had a great many complaints from our operating department regarding delays to trains caused by high ash coal, most of which stemmed from improper preparation at the mines."

Railways Tap Reserves

Railway purchasing agents and coal companies are inclined to the belief that enough coal of the usual grades will be available for this winter but quality coals for other industries will be scarce and shortages of special purpose grades are foreseen. Although the railways were partially successful in replenishing their storage stocks during the summer, suspension of work at the mines forced them to dip deeply into their reserves. Stocks on November 1 amounted to 10,099,000 tons representing 32 days' supply and down more than seven per cent from the previous month's total which represented 35 days' supply. At the same time last year railway storage stocks averaged 42 days' supply. As a hedge against possible suspension of work by the miners pending a probable re-negotiation of wage agreements next spring, the roads are inclined to buy and stock all the coal that can be had.

Early 1945 was a critical period in railway coal procurement because of adverse weather conditions that hampered both production and delivery. As a result many railways were unable to secure current needs from the mines and reserves were severely depleted by spring. On March 1 the O. P. A. provided price increases for sub-districts in Ohio ranging from 10 cents to 30 cents a ton that had to be absorbed by the railways. Because wage agreements were not consummated by April 1, a short suspension in mining occurred prior to the adoption of a new open-end agreement with no definite expiration date but subject to re-opening in the event of changes in the government's wage policy or upon request for re-negotiation by either party in March, 1946. The O.P.A. upped maximum prices on May 1 because of increased cost of the new wage agreement resulting in country-wide increases of 16 cents a ton for railway accounts.

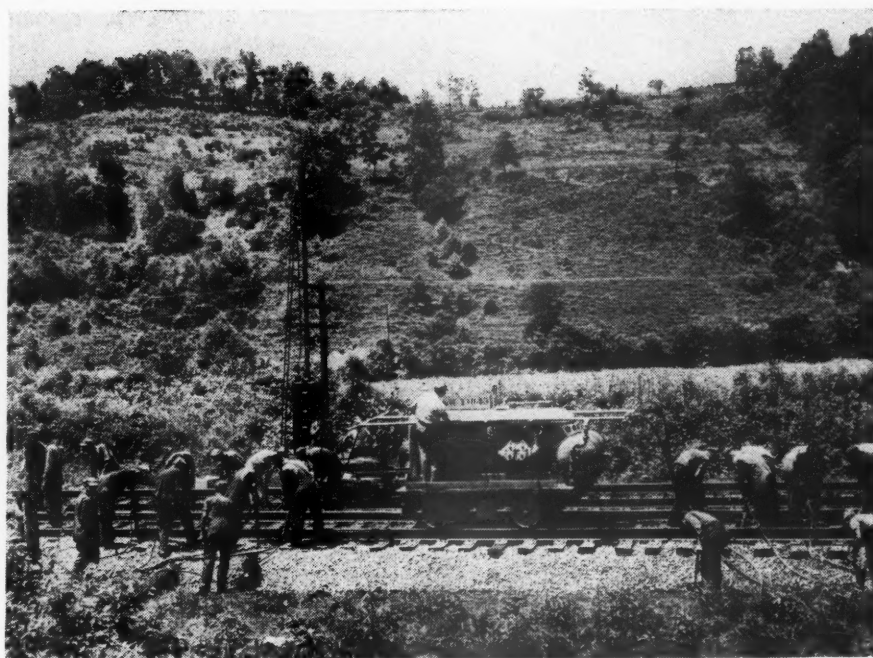
The end of the war in Europe and subsequently in the Pacific area had little softening effect upon the general market demand for coal, principally because of the urgent need for filling Great Lakes commitments and the export program to help provide fuel for European nations this winter. A grave crisis developed during the latter part of September when the United Mine Workers attempted to unionize supervisory mine forces and by mid-October practically all Eastern mines were at a standstill. Attempted conciliation by the Department of Labor failed and miners did not return to the pits until October 22, after orders from John L. Lewis to await "a more opportune time."

How Cold and How Much Coal?

After a particularly difficult coal year climaxed by an early onset of winter, Canadian roads hope for some relief in 1946, although conditions for the next few months will be governed largely by the intensity and length of winter. Given normal winter weather little if any trouble is anticipated, but, if the winter should be unusually cold, adequate supplies will be difficult to maintain. With little improvement in labor scarcities, during summer and fall, extensive absenteeism and after a miners' strike in Alberta which spread to British Columbia, including all of District 18, and persisted for almost a full month and did not end until October 22, the situation eased somewhat with respect to common labor but a shortage of qualified miners still exists. Under these circumstances stock piles have been depleted. Because of changes in price structure, costs were increased but this was offset to some extent by the elimination of the Canadian War Exchange Tax about the middle of the year and a reduction of approximately one-half of 1 per cent in U. S. exchange.

Controls Dropped Too Soon?

Although opinion among procurement officers is divided, the majority are of the opinion that material controls were relaxed too soon and too abruptly. "Under the controlled materials plan," declared one purchasing agent, "a pattern of procurement had been established, in accordance with W. P. B. regulations, suppliers and consumers cooperated and, for the most part, deliveries were made as planned when orders were placed well in advance of delivery dates. Since September 30 there has been considerable confusion and more uncertainty, particularly with regard to orders placed for deliveries in 1946." After pointing out that these conditions arose not so much from shortages of raw materials as from labor shortages, strikes and less production per man per



A recent survey shows that buying of maintenance of way work equipment in 1946 will outstrip last year's \$17 million purchases

day, he continued: "Although I do not believe that the W. P. B. could have prevented these occurrences, nevertheless I am of the opinion that better distribution of available materials could have been accomplished under W. P. B. control."

The chief procurement officer of an Eastern road attributed wholehearted cooperation with all governmental war-time edicts, no matter how harsh or unreasonable they may have appeared at the time, as the reason for excellent success in securing the necessary materials and equipment to keep their railway operating, and in good condition. After admitting that the delivery of nine 25-ton locomotive cranes was spread over the period from March, 1941, to the last half of 1945, he pointed out that their war-time deliveries included 2,000 box cars, 60 Diesel-electric road locomotives, an equal number of Diesel switchers, three 250-ton wrecking cranes and much more shop equipment, machine tools and maintenance of way work equipment than ever were received by that road during any period of the same length. War-time deliveries also included, he said, all the rails they wanted to lay, and all the ties that limited manpower could insert. He added: "With the exception of ties, I doubt that there is much deferred maintenance on our road notwithstanding the material situation and labor shortages. Rigid and intelligent control of material prices during World War II restricted average increases to approximately 20 per cent in contrast to about 100 per cent during and immediately following World War I."

From a railway purchasing agent in

the Southwest comes another typical comment regarding material and price controls: "Although it may be too early to determine whether the lifting of restrictions will be beneficial to the railways," he said, "our experience so far leads us to believe that lifting the restrictions has not accelerated deliveries but to the contrary some degree of 'slow down' has resulted. Because of the upward trend I believe that we should hope for a continuation of price regulation throughout 1946 to discourage inflation."

One Officer's View

An interesting conclusion is drawn by another purchasing agent of a railway operating through the Northwest, who said: "Although when governmental controls first were introduced, we were very much concerned as to their effect on procurement, believing them to be extremely burdensome, since the abolition of the C. M. P. and government regulations, we have discovered that it is much more difficult to purchase materials in the so-called open market, and also, that deliveries are considerably slower in many instances. I now believe that it would have been much better for all concerned if the W. P. B. had been permitted to retain control until reconversion at least was further advanced. Although many suppliers have accepted and will continue to accept orders in the sequence in which they are received, some manufacturers supply materials to create new customers and possibly manufacture materials that are more profitable."



C. P. R. locomotive for "general utility" service—All photos courtesy Canadian Pacific

Canada's Railways Have Fingers Crossed

Popular leaders' praise has been generous, but will gratitude be translated into more utilitarian form?

By OUR OTTAWA CORRESPONDENT

IT looks like Marquis of Queensberry rules for the Canadian railways in their struggle for lower operating costs and higher net revenues, because most of the odds, economic and political, seem to be against them, and the prospects of their emerging from an over-worked war period with something more tangible than the spoken thanks of the people to show for a tremendous national service cannot be called bright.

Piled on top of the many obstacles to higher freight rates is the arresting anomaly of the Dominion Parliament's—which not so long ago paid warm tribute to the magnificent achievements of the railways in moving to the seaboard early in the war, and from that area since the war's end, hundreds of thousands of personnel and a mountainous pile of munitions and other material—now making it plain, not in open speech but in conversation, that the present would not be an opportune time for the roads to seek higher rates.

The Dominion Parliament is not the only offender nor the only political obstacle either. In recent weeks the heads of the governments of British Columbia and Alberta have sent warnings by letter to the Dominion authorities and to the Prime Minister against any move by the railways through the Transport Board

Some political spokesmen who have been most laudatory of the railways' unparalleled war effort are just as niggardly in their view of the rate level as they ever were. Still, the Dominion is expecting a satisfactory volume of business in the years ahead, and this will be reflected in railway traffic volume; and the railways are alert to service and plant improvements to the extent that their means will permit. So far, mutual relationships between managements and union leaders have been constructive.

to get higher freight rates. These provincial premiers had not long ago joined in the general public accolade to the railways.

Still another anomalous situation has confronted the Canadian railways for some time. While the Dominion Transport Board is regarded by Parliament and people as the officially designated commission for dealing with railway freight rates, that Board has been actually on the shelf throughout the war

as a regulatory and judicial body because regulation of railway rates has been assumed by the Wartime Prices and Trade Board (the Dominion counterpart of the O. P. A. south of the border), the contention being that any rise in freight or passenger rates might be a threat to price and wage ceilings.

An interesting instance of the extent to which the Prices Board has held its heavy hand upon railway rates came to light not so long ago. The Interstate Commerce Commission granted to certain American roads an increase in international rates. The Canadian roads applied to the Transport Board at Ottawa for a rate increase on export and import movement that would place them on a parity with the American roads in this respect. The Transport Board granted the increase but the Wartime Prices and Trade Board stepped in and barred the increase as contrary to the Cabinet order early in the war establishing price and wage ceilings.

Then, to show just how difficult the rate situation can be made for the railways up here, the Canadian roads shortly before the war cut their rates on certain commodities to meet Great Lakes and highway competition; when the war conditions vastly reduced this competition, the railways sought authority

to restore the rates to their higher level but they were refused.

Like the American roads, the Canadian railways have fought a good fight throughout the war in operating under all sorts of handicaps, including a steadily increasing proportion of unskilled employees, a mounting accumulation of deferred maintenance and traffic congestion at the worst possible times and places. During the past few weeks there has been a rapid return to the railway ranks of men who did valorous service overseas, and the personnel problem no longer causes concern, but the really serious task of replacing badly worn equipment and repairing roadway and structures has yet to be done.

This rehabilitation program must be undertaken, too, with not nearly the consideration shown by the federal and provincial governments to other private concerns. Important tax concessions were made this fall by the Dominion government to private business and industry to encourage and facilitate reconversion to peace-time basis, and, while these concessions will also be enjoyed by the railways, the financial benefit accruing to them under the excess profits tax law will not be as helpful, proportionately, as to other private business. The railway's reconditioning and betterment programs will require a larger percentage of total expenditure in the next two years than will the reconversion costs of many other concerns.

Wary of Rate Increases

The railways in previous years, before the war and through the worst of the depression period, obtained loans from the Dominion treasury for the purchase of new equipment. But now, when most people have the impression that the railways prospered mightily during the war, their representatives in Parliament may be expected to be extremely vigilant should the railways seek rate increases. The people have not been told that whatever large rise in revenues the railways enjoyed as a result of a world war were insufficient to compensate for the impoverishment the railways suffered in the pre-war period.

The labor situation in Canada today is far from being as serious as it is south of the border, although many large employers have their fingers crossed. The railways have been remarkably free of labor difficulty but whether that condition will continue with the passing of the war remains to be seen. There is one wage application of any consequence pending and that is from about 12,000 brakemen for a \$2.50 a day increase. This application is before the railways and has not yet reached the National Labor Board which

would eventually have to deal with it. It must be said the Canadian railway executives and union officers have shown unusual understanding in handling their mutual problems, and Reconstruction Minister C. D. Howe in a recent debate in the House of Commons at Ottawa paid a high tribute to the amicable manner in which the railways and their employees have ironed out their troubles in private, seldom requiring the aid of a public board to reach a settlement.

Traffic Down Only Slightly

Due to a continued heavy repatriation movement and to the large industrial reconversion and munitions unscrambling jobs at home, the railway traffic throughout 1945 remained remarkably heavy and showed a very slight drop from 1944. For the full calendar year of 1945 the total revenue cars loaded will probably reach 3,650,000 as compared with about 3,700,000 in 1944, but the decline will really become apparent early next summer. The Canadian roads, proportionately even, have a much smaller repatriation job than the American lines, since the homeward movement of troops is almost entirely westbound. The number of Canadian armed forces to be moved eastward across the Pacific is negligible. The demobilization movement, therefore, has been almost entirely a one-way movement, westbound.

There is hope for the railways in prospects for export and import movement of goods in the post-war years. Determined efforts are being made by the Dominion government to stimulate the extension of trade pacts with other

nations and to maintain a post-war trade at not much less than 75 per cent of that attained in the war. Before the war broke Canada was the third largest world trader and it hopes to retain that position.

Still another favorable factor is this country's highly lucrative tourist business, and here again the federal and provincial governments are giving valuable financial and other support to campaigns for expanding this traffic. Next summer both railways will reopen all their summer hotels and resorts.

In his year-end review of 1945 accomplishments and the 1946 outlook, D. C. Coleman, president and chairman of the Canadian Pacific, said in part:

"Studies made while every sinew was strained in the prosecution of the war enabled the Canadian Pacific to start upon its peace-time role as soon as warfare ceased. Reconversion of machinery and services; and restoration to civil employment of men and women of the company's staff stood first on the list of post-war necessities. Both, as the result of advance planning, are proceeding satisfactorily.

"Materially, the report for the closing year is good and the outlook for 1946, on the whole, bright. Reconversion to peacetime production and service of those sections of the company's activities that were devoted to the war effort is proceeding with drive and urgency. Records have been made in this change-over which equal the records made in placing Canadian Pacific machinery on a war-time basis. At Ogden Shops, Calgary, only 60 days were needed to transform an all-out war industry into

Pastel shades are used in interior of this dining car on the Kettle Valley run in B. C. and Alta.



one of the most up-to-date assembly-line locomotive shops in America. Angus Shops, Montreal, a high-production, dual purpose plant in the war years, rehabilitated itself equally rapidly.

"I am glad to be able to state that Canadian Pacific men and women who have already returned from the services have brought with them new knowledge, new skills, new responsibility. Return of personnel, due to understandable reasons, has not been so rapid as material rehabilitation, although, in the past few months a fast increasing tempo has been noted. Of the 20,847 men and women who enlisted, 3,217 had resumed duty with the company by the end of October. The rate of return doubled itself in that month and a similar geometrical progression is anticipated as demobilization proceeds.

"On the seas the remainder of a pre-war fleet depleted by the heaviest war losses ever borne by one company, with a consequent tragic loss of brave men, has been augmented by the first of four new cargo carriers, S.S. Beaverdell, a 10,000-ton, 16-knot, modern vessel. With her running mates, this new ship will be employed in fast regular freight transport between Canada and London.

"Of the passenger vessels still afloat not much can be said until repatriation is completed and controls—necessary in war but hampering to profitable peacetime operation—are lifted. The present high building costs for new ships do not promise immediate replacement of the entire Atlantic and Pacific services, but the company envisions the reestablishment of service on both oceans with a minimum of delay.

"To prepare for the fruitful years which should lie ahead, the Canadian Pacific has maintained its physical assets at a high state of efficiency and reliability, while devoting every effort to the successful prosecution of the war.

What the future holds for Canada, and the Canadian Pacific—for the two have been synonymous since confederation—is in the hands of the Canadian people. With sound government, the wise expenditure of public, corporate and private funds; with real friendship and honest co-operation between industry, labor, primary producers and consumers, 1946 and the succeeding post-war years can become the most prosperous era this great Dominion has every experienced."

President and Chairman R. C. Vaughan of the Canadian National in his year-end statement reported in part as follows:

Earnings Top '44's

"We face the future with confidence, in the knowledge that men of good will are working to organize machinery not only to solve the immediate problems of the world but to make sure that there will be no third world war. We are already beginning to change our pace and our direction and to adjust ourselves to the new world which must arise out of the ruins of the old. This change is reflected in the year's work of the Canadian National. To the end of August, our revenue had been slightly larger than in the previous year, but during September the trend turned downward and we estimate that for the full year there will be slight reductions both in the amount of freight handled and the number of passengers carried, with consequent reduction in operating revenues. This, however, is offset to some extent by a decrease in operating expenses and the Canadian National will be able to pay to the Canadian people a cash surplus of \$25,000,000, an increase of \$2,000,000 over the surplus in 1944.

"During the war, the cost-of-living bonus and increases in basic wage rates,

following awards of the National War Labor Board, added approximately \$40,000,000 to our payrolls as compared with 1939. There were no further increases in wage rates in 1945 and payrolls amounted to \$221,520,000. On the other hand, the material price index rose from 133.7 in 1944 to 136.4 last year and due to increased prices materials cost \$22,500,000 more than in 1939.

"Our share in the repatriation of the armed forces made heavy demands on all our resources, both human and material, but it was a work which gave us great satisfaction. We have been called upon to carry four times as many passengers as in the pre-war years and, owing to the restrictions of war, we have been obliged to do it with practically no increase in equipment. This has meant, frequently, that no sooner were passengers detrained, at points as far west as Winnipeg, than the trains were speeding back to the seaport to meet another troop ship. It has been found necessary on several occasions to withdraw sleeping and dining cars from regular runs in order to take care of the military traffic and the public has accepted the inconvenience with an admirable spirit of understanding and co-operation.

16 Trains for a "Queen"

"I might mention that an arrival of the "Queen Elizabeth" calls for as many as sixteen special trains, dispatched at the rate of one an hour.

"The eight hotels wholly operated by the Canadian National were again handicapped in 1945 by the difficulty of obtaining qualified staff and by shortages of foodstuffs, but high standards were maintained. The company's three summer resort hotels, Jasper Park Lodge, in the Rockies, Minaki Lodge, in Ontario, and Pictou Lodge, in Nova Scotia, which have been closed for several years past, will be opened again this coming summer. The large number of reservations already made is one sign of the gradual return to normal. The facilities of the Canadian National Telegraphs were taxed to capacity this year and the volume of traffic was the heaviest on record.

"Three of the 'Lady' liners formerly in the Canadian National West Indies fleet were lost during the war and the two remaining ships are still on war duty. The company is now operating 11 vessels in freight service to the West Indies. Two of these ships are giving a limited passenger service for essential travel.

"The Prince Rupert Dry Dock & Shipyard, a Canadian National subsidiary, which has been constructing minesweepers and freighters, is completing



A weight-saving aluminum box car



New stations are of modern architecture

its program, and National Railways Munitions, Ltd., in Montreal, completed its war contracts during the year and is now closed. Our associate company, Trans-Canada Air Lines, added to its fleet of aircraft and extended its operations, which include a trans-Atlantic service. Its activities will be greatly expanded as facilities become available.

"We have entered the period of transition and our post-war plans are well advanced. In co-operation with the Canadian Marconi Company, the Canadian National has this past year been experimenting with the yard operation of trains by radio. When it again becomes possible to obtain new equipment, the traveling public will be given the benefit of the latest trends in passenger cars, designed by our own architects in consultation with other departments. Due to shortages of labor and materials, repairs and renewals not im-

mediately essential have had to be deferred during the war years, but our property was well maintained to insure safety in operation. We have set aside a substantial cash reserve, invested in Victory bonds, for post-war repairs and renewals.

A reserve fund for the amortization of war projects, inventory reserves and pension fund reserves have also been invested in Victory bonds.

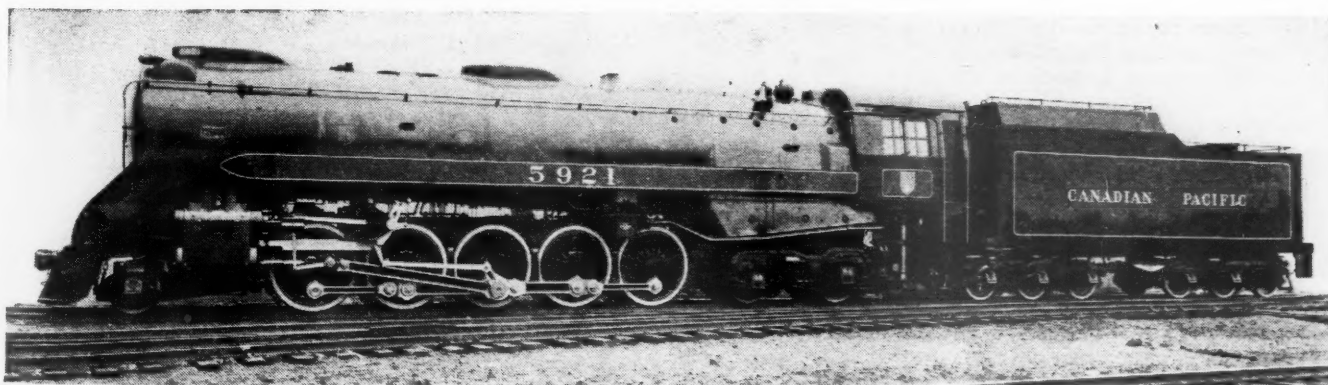
"Our program of rehabilitation is working smoothly and already we have been glad to welcome to Canadian National service approximately 10,000 war veterans. Fifteen years ago, a rehabilitation committee was set up to re-establish employees injured in railway service. Regional sub-committees have been established throughout the system to deal quickly with wartime rehabilitation cases.

"The war has demonstrated beyond

any doubt the capacity of the Canadian National to handle traffic in tremendous volume. How far traffic will recede in the post-war period we cannot say. There seems reason to believe that there will be more work in Canada after the war than there was before and this will make more work for the railways. At the same time, we are aware that competition with other forms of transport will become keener. Continuing to operate the system as economically and as efficiently as possible, we shall meet this competition with vigorous action. Canada still enjoys a level of freight rates which on a per ton-mile basis is the lowest of any civilized country.."

The 1945 construction and equipment acquisition programs of the Canadian railways are recorded in the statistical articles in this issue which report these programs for the railways of the entire continent.

2-10-4 used in the Canadian Rockies





Conductor in caboose using train telephone during tests on the Milwaukee

Train Communication

Squared Away

in 1945

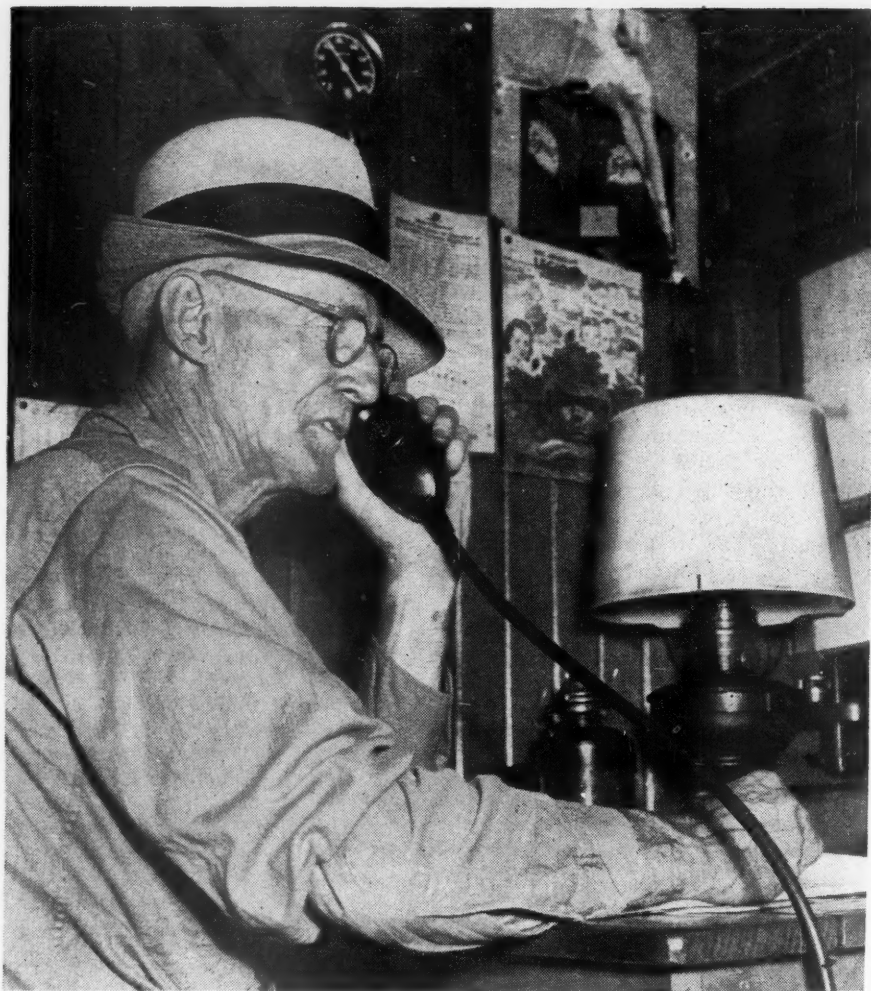
By JOHN H. DUNN

Signal and Communications Editor

Federal Communications Commission establishes train communication on permanent basis from standpoint of regulation, and manufacturers have reconverted to railroad equipment which clears the deck for 1946

IN the field of train communication the most important happenings during the year 1945 were the actions by the Federal Communications Commission to allocate frequencies for railroad radio and to issue rules and regulations for railroad radio service including facilities for train communication as well as between railroad offices. The announcement included a statement that the commission is considering the possibility of relaxing the present low power rule concerning railroad inductive or carrier current train communication systems. In the meantime the end of the war permitted manufacturers to reconvert to the construction of railroad equipment on a production basis. Therefore all factors are now squared away for ex-

War conditions caused delays but manufacturers are now in production on railroad apparatus; in the meantime the Federal Communications Commission issued frequency allocations and other regulations to establish railroad train communication on a permanent basis so that all factors are squared away for rapid progress in 1946, except that in the meantime the Interstate Commerce Commission developed a dog-in-the-manger attitude concerning jurisdiction of train communication.



Conductor using train telephone during tests on the North Western

tensive installation of train communication in 1946, except for a discordant note from the Interstate Commerce Commission.

During 1945 the Kansas City Southern proceeded with an installation of the induction carrier system using apparatus made by the Aireon Manufacturing Corporation. The project extends on 650 miles of single-track main line between Kansas City, Mo., and Shreveport, La., with equipment at 20 stations in addition to two yard offices in Kansas City, the dispatchers' offices at Pittsburg, Kan., Heavener, Okla., and Shreveport, La., as well as the superintendent's office at Pittsburg. Four road freight locomotives, one Diesel-electric passenger locomotive, four cabooses and one business car are equipped. The wayside stations were completed early in 1945, and the installations on locomotives and cars were completed on July 31, and have been in regular service since.

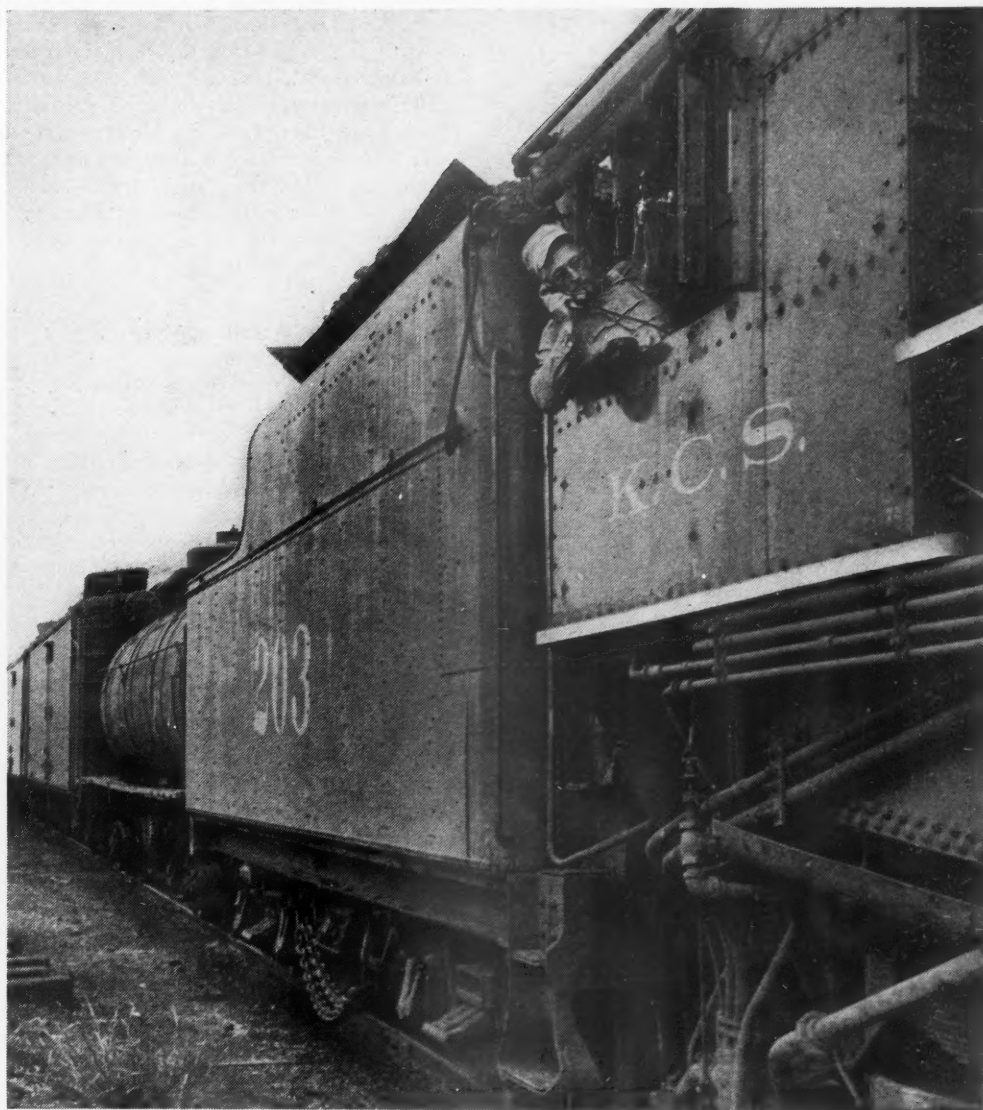
The Pennsylvania has placed orders with the Union Switch & Signal Company for inductive train communication equipment to be installed by the railroad on 245 miles of four-track line between Harrisburg, Pa., and Pittsburgh, including 275 locomotives, 90 cabooses and 6 wayside stations.

The Atlantic Coast Line has ordered inductive type train communication equipment from the Union Switch & Signal Company for installation on 234 miles between Rocky Mount, N. C., and Florence, S. C., via Wilmington, N. C., including 20 road locomotives, 14 cabooses and 4 wayside stations.

The Denver & Rio Grande Western has ordered equipment for end-to-end and train-to-wayside train communication on 575 miles between Denver and Salt Lake City, including apparatus for 15 Diesel-electric freight locomotives, 15 cabooses and 10 wayside stations. Radio at very high frequency will be used for the end-to-end communication, and in addition the cabooses will be equipped with low-frequency carrier-induction units for communication with wayside stations in a range of up to about 75 miles. This communication equipment, made by the Aireon Manufacturing Corporation, is being delivered now, and installation work is scheduled to start January 15.

The Missouri Pacific has announced a project of train communication on 193 miles of single track between McGehee, Ark., and Alexandria, La., including 15 steam locomotives, 15 cabooses and 7 wayside stations. Radio equipment is to be used for communication between locomotives and cabooses, and inductive-carrier apparatus between cabooses and wayside stations.

The New York Central System is now receiving and installing train communi-



The Kansas City Southern has train communication in service on 650 miles including 10 mobile units and 26 wayside offices

cation equipment on 141 miles between Indianapolis, Ind., and Springfield, Ohio, including equipment on 10 locomotives, 10 cabooses and 20 wayside stations. This apparatus is of the induction-carrier type furnished by the Aireon Manufacturing Corporation.

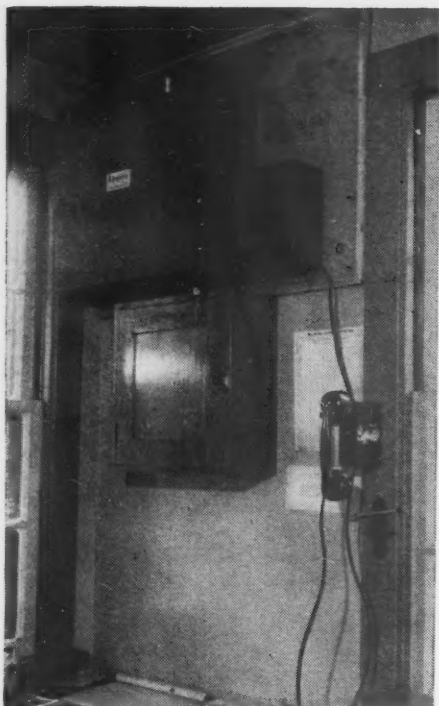
Most Everybody Made Tests

Space is not available here to recount all the tests of train communication made by the railroads during 1945. Typical instances only, therefore, will be discussed. In April, 1945, the New York, New Haven & Hartford made a test of train communication in electrified territory using equipment furnished by the Westinghouse Electric Corporation. Early in 1945 the Milwaukee made tests of the Union Switch & Signal Company inductive system in electrified territory through tunnels and mountainous country in Washington and Montana. This same type of equipment is now being

made on a production basis for deliveries to the Pennsylvania and the Atlantic Coast Line, as noted previously.

Radio telephone train communication using apparatus made by the Bendix Radio Division of the Bendix Aviation Corporation was tested during 1945 in road service on many railroads, including the Burlington between Chicago and Denver; the Baltimore & Ohio between Baltimore, Md., and Willard, Ohio; the Santa Fe between Chicago and San Francisco; the Denver & Rio Grande Western between Denver and Salt Lake City; the Chicago & North Western between Chicago and Clinton, Iowa; the Northern Pacific between St. Paul and Seattle; the Great Northern on the Iron Range; and also on various territories on the Milwaukee, the Lackawanna, Florida East Coast, Southern Pacific, St. Louis-San Francisco, Gulf, Mobile & Ohio and the New York, Ontario & Western.

The equipment used on these tests was



Induction carrier train communication in wayside office on Illinois Central

designed during the war for military uses. Based on experience gained on these and previous tests the Bendix Corporation designed new equipment especially for railroad service, and these new types of units are now being manufactured on a production basis so that they can be delivered in quantities early in 1946. The first deliveries in limited quantities are scheduled for the Northern Pacific, the Milwaukee and the Santa Fe.

Tests on Some Other Roads

As explained in the discussion of permanent installations, the Kansas City Southern has an extensive project using apparatus made by the Aireon Manufacturing Corporation, and this type of equipment was used in tests on numerous other roads including the Illinois Central; the Gulf, Mobile & Ohio; the New York Central; the Denver & Rio Grande Western; the Southern Pacific; the Alton; the Erie; as well as the National Railways of Mexico. On the Illinois Central, tests were made of not only the induction-carrier system but also the high-frequency straight radio apparatus also made by Aireon.

On the Chicago, Rock Island & Pacific, frequency-modulation radio telephone equipment made by the General Electric Company has recently been installed on three Diesel-electric freight locomotives and three cabooses used in fast through freight service between Rock Island, Ill., and Fort Worth, Tex., 913 miles, with wayside offices at Rock Island, Ill.; Kansas City, Mo.; Hering-

ton, Kan.; El Reno, Okla.; and Fort Worth, Tex. Also on the Rock Island, one locomotive and one caboose, used in through freight service between Rock Island and Kansas City, 336 miles, as well as between Rock Island and Omaha, Neb., 329 miles, are equipped with end-to-end communication apparatus using Klystrom micro-wave equipment made by the Sperry Gyroscope Company.

Radio Warning Signal

On December 18 the Bendix Radio Division of the Bendix Aviation Corporation announced a new radio device to send a warning to approaching trains when any train has been stopped under unusual circumstances. The device is intended as an adjunct on sections of railroad in which radio train communication is being installed on the locomotives used on road trains.

The proposal is that each locomotive be equipped with apparatus so that if the train makes an unusual stop, the engineman can operate a push-button which causes a device to broadcast a special high-frequency slow-tone in the form of a series of high-pitched tones, that will be received as a warning to enginemen in the locomotives of other trains within a range of four to five miles. The device is not intended to replace any safety equipment or practice now in use on railroads, but rather to supplement existing measures.

Yard Communication

Facilities for telephone conversation between yard locomotives and offices in yards or terminals are known as yard communication systems, whereas the term train communication is applied to road trains. A brief history is that in 1941 the Louisville & Nashville installed the Union Switch & Signal Company inductive yard communication system in a yard at DeCoursey, Ky., and since that time the same system has been installed and is in regular service in about 15 other yards on various roads including the Pennsylvania, the Burlington, the Great Northern, the Norfolk & Western, the Big Four and the Terminal Railroad Association of St. Louis.

During 1945 the Baltimore & Ohio installed radio communication in a yard at New Castle, Pa., using Bendix radio apparatus to equip three yard locomotives and one fixed station, the equipment being furnished by the Bendix Radio Division of the Bendix Aviation Corporation. Also the Burlington made an installation of Bendix radio apparatus in the terminal at Chicago including seven Diesel-electric switch locomotives and three yard offices. Early in 1946 this project is to be expanded to equip 18 additional locomotives.

At Corwith yard in Chicago, the Santa Fe is conducting tests of Bendix radio apparatus including three locomotives and one yard office. Also at this yard the Santa Fe recently made a test of the advantages of frequency modulation as compared with amplitude modulation, using radio apparatus furnished by the Farnsworth Television & Radio Corporation. No definite conclusions are as yet available. Starting on December 3, the Reading began conducting tests of radio apparatus made by the Maguire Industries, Inc.

In 1945 the New York Central installed radio communication in Selkirk yard near Albany, N. Y., consisting of four mobile units and one fixed station, this apparatus being furnished by the General Railway Signal Company. Radio equipment also furnished by the General Railway Signal Company will be installed early in 1946 in two yards near Syracuse, N. Y., and one yard near Buffalo, N. Y. Each of these projects includes four mobile units and one fixed station. Also in 1945 the New York Central had a test installation of radio in service at Weehawken, N. J. This test included apparatus on one locomotive and one wayside office, the equipment being furnished by the Halstead Company now part of the Farnsworth Television and Radio Corporation.

On the Denver & Rio Grande Western authority has been issued to install radio communication in the yard at Denver including seven Diesel switching locomotives and two yard offices.

During 1945 the Canadian National installed radio telephone communication equipment on ten locomotives and in two yard offices in the Longue Pointe yards at Montreal, Que. This was furnished by the Canadian Marconi Company.

In a large freight yard at Blue Island, Ill., near Chicago, the Rock Island installed Motorola radio telephone communication apparatus on four yard locomotives and in the yardmaster's office.

Sound Systems

In order to classify the types of apparatus, the term sound system has been applied to projects in which fixed microphones in offices or elevated shanties are connected to amplifiers with wire circuits to loud-speakers at various locations in yards where they can be heard by conductors and switchmen as well as by enginemen on yard locomotives. Microphones at certain locations in the yard are used for talking back to the office or to loud-speakers in other sections of the yard.

During recent years several large yards have been equipped with these so-called sound systems. For example, in 1945 the Denver & Rio Grande Western installed, in a yard at Grand Junction,



During the last 15 years the Bessemer & Lake Erie has cooperated in the development of train communication

Colo., a two-way communication system including 12 outlying speakers and 2 paging speakers, operated from a control console, by means of which it is possible to communicate with personnel at several locations throughout the yard. The loud-speakers were furnished by the Webster Electric Company and the amplifiers by the Radio Corporation of America.

Another similar communication and paging system is now being installed in the Roper yard near Salt Lake City with the control consoles in two 45-ft. towers each of which commands a good view of the portion of the yard assigned to it. In this project the speakers are being furnished by Webster and R.C.A., the amplifiers by the Electronics Communication Equipment Company, and the rectifiers by the Raytheon Manufacturing Company.

Somewhat similar sound equipment, designated as announcing systems, has been installed during the past several years in numerous passenger stations and train sheds as well as in freight depots. In some of the new streamlined trains, loud-speakers in the various

passenger cars will be connected to a microphone in the conductor's "office" by means of which the stations can be called, and other announcements made to passengers.

F. C. C. on Use of Radio

A brief history of the early use of radio for train communication is that the railroads made numerous tests during the past 25 years but in the range of frequencies used before the war there were none available for permanent assignment to the railroads. In recent years, especially during the war, many developments were made in the use of high-frequency apparatus so that many more channels are available. Accordingly in September, 1944, the Federal Communications Commission held extended hearings to receive evidence from the railroads and the manufacturers concerning the uses for train communication, especially with reference to the need for assignment of radio frequencies for this service. On January 16, 1945, the Federal Communications Commission issued a report proposing an allo-

cation of frequencies for various services including that on railroads. After further hearings, definite assignments of frequencies were made on May 17. In order to simplify the assignments of frequencies, the various railroads have cooperated through a committee of the Communication Section of the Association of American Railroads in applying to the Federal Communications Commission for assignments of frequencies to the different carriers.

A further doubtful factor was cleared up on August 21, when the F. C. C. issued an order stating in effect that railroad employees using radio telephone equipment on locomotives and cars or in wayside offices need not be required to hold operators' licenses.

Then on November 15, the Federal Communications Commission issued its rules and regulations governing railroad radio service which deals in detail with the apparatus, tests, inspections and methods of operation. The Commission also announced that it is considering the possibility of relaxing the present low power rules which govern the railroad carrier-current communication systems,

otherwise known as inductive systems.

A summary of the various actions by the Federal Communications Commission during 1945 is that the railroads were given about all they might reasonably expect, and the general opinion is that the railroads can now proceed to utilize radio train communication with assurance. The item concerning the raising of the low power limit for inductive systems is also of importance to roads planning to use this type of equipment.

Discord from I. C. C.

Back in 1937 a law was enacted giving the Interstate Commerce Commission jurisdiction of . . . block signal system, interlocking, automatic train stop, train control, and/or cab signal devices and/or other similar appliances, methods and systems intended to promote the safety of railroad operation, . . . Under this law the railroads are required to make applications to the I. C. C. for permission to make changes in facilities named in the law as quoted above.

When the Atlantic Coast Line decided

to install train communication on approximately 234 miles between Rocky Mount, N. C., and Florence, S. C., via Wilmington, an application was made to the Interstate Commerce Commission for permission to make the installation. On February 19 the I. C. C. issued two orders, one authorizing the A. C. L. to install the train communication, and the second one ordered the railroad to show cause why it should not be required to install block signaling on not only the 202 miles of single track in the proposed train communication territory, which had no signaling, but also on approximately 1,848 miles of other portions of the A. C. L., on some of which there was only one passenger train scheduled daily as well as on 63 miles between Florence, N. C., and Wadesboro where there was no scheduled passenger service. According to the best information available, no hearings have been called or other action taken on this matter.

The Missouri Pacific applied to the Interstate Commerce Commission for permission to install train communication, and as of November 9 this Com-

mission issued two orders, one authorizing the train communication project, and the second ordering the railroad to show cause why a signal system should not be installed on 72.9 miles of line which is the part of the proposed train communication territory that is not now equipped with automatic block signaling.

May Halt Some Installations

Although the I. C. C. thus accepted and acted upon applications concerning train communication, Senator Wheeler, on November 1, introduced bill S. 1537 proposing a law to the effect that the Interstate Commerce Commission be given jurisdiction of not only train communication but also other railroad telegraph and telephone facilities.

This question of whether the Federal Communications Commission or the Interstate Commerce Commission is to have jurisdiction over the installation and operation of train communication is confusing to some railroads, and may cause hesitancy in proceeding with proposed installations.

The Canadian National has radio telephone communication on 10 locomotives and in two offices in a yard at Montreal



Mexican Railways Set Earnings Record

Increased tonnage and 25 per cent rise in rates enabled National Railways of Mexico to reach all-time peak revenues

BY OUR CORRESPONDENT IN MEXICO

THE rehabilitation program of the National Railways of Mexico, started in 1941, continued on a high level through 1945, enabling at least one important change in railway operating methods; viz., the establishment of through manifest freight trains between Mexico City and the principal interchange points with U. S. railways.

Numerous changes in the executive staff were made, including a new board of directors which is now an administering body rather than an advisory group as before. Under the new organization the president of the board is the under-secretary of the Mexican government, the eight other members comprising the body consisting of one each from the labor, communications and national economy departments of the governments; a representative of the Chamber of Commerce; another from the Chamber of Industry; two from the Mexican Union of Railway Workers; and the general manager of the railways. Pablo M. Hernandez was appointed general manager during February, succeeding Andres Ortiz, who died. Other appointments were Conrado C. Rochin, assistant general manager in charge of transportation, maintenance of way and personnel; Manuel Mayagoitia, assistant general manager in charge of miscellaneous departments; Albert Garduno,

general superintendent of transportation; Juan Velasco, purchasing agent; J. Guadalupe Estrada, general treasurer; Jose Gutierrez, general superintendent of express; Pedro Angelini, general superintendent of motive power and machinery; and Pedro C. Morales, assistant general manager in charge of motive power and machinery.

Elliott V. Vandercook, chief of the United States Railway Mission in Mexico, resigned to become vice-president and general manager of the Southern Pacific of Mexico and was succeeded by R. J. deCamp, director of the rail transportation division, transportation and economics department, Office of Inter-American Affairs, of the United States government.

Rehabilitating the Line

The rehabilitation program was carried well into 1945, particularly so as regards roadbed, relaying of 112 lb. rail and bridge reinforcement on the line from Mexico City to Nuevo Laredo. Rehabilitation work continued on the line from Cordoba and Vera Cruz to Suchiate on the Guatemala border. Heavy rains and floods washed away several miles of track and roadbed on the Isthmus of Tehuantepec and on the line Puebla to Oaxaca, the recon-

Continuation of the extensive improvement program through 1945 culminated in the establishment, for the first time, of through manifest-freight trains between important centers. Diesel-electric locomotives have been inaugurated on certain passenger runs, relieving badly needed steam locomotives for assignments elsewhere. Orders have been placed for 24 Diesel freight, 14 Diesel passenger, 6 Diesel road-switching and 32 steam locomotives and for 1,500 box cars. International traffic declined somewhat as compared with 1944, due largely to lack of sufficient power to handle this traffic concurrently with greatly increased local traffic. Both operating revenues and operating expenses increased materially, net earnings rising from 16,014,374 pesos to 23,394,013 pesos, or 46.08 per cent.



Higher track standards enabled the establishment of manifest freight service on many lines

struction of which cost approximately \$2,000,000.

The improved condition of tracks has permitted the establishment of through manifest freight trains from Mexico City to Nuevo Laredo, Ciudad Juarez and Guadalajara, and from Tampico to Torreon. Passenger trains number 7 and 8 are now handled with Diesel electric power between Torreon and Ciudad Juarez, a distance of 522 miles with great success, two Baldwin 2,000-hp. Diesels being used for the purpose. These two units released seven steam locomotives for other service.

Along with track improvements during the past year, 26 second hand locomotives were purchased, due to inability to secure new units. However, orders were placed far in advance for twenty-four 2,700-hp., Diesel electric locomotives for freight service; fourteen 3,000-hp., passenger engines, and six road-switchers, besides 32 steam locomotives for freight and passenger service. This motive power will be delivered in the

Loaded Cars Interchanged—10 months

	Imports		Exports	
	1945	1944	1945	1944
Laredo	15,978	20,898	12,168	14,376
El Paso	2,765	3,369	6,564	8,558
Eagle Pass	3,982	4,142	2,170	1,935
Brownsville	1,718	1,663	2,990	3,449
Totals	24,443	30,072	23,892	28,318

first quarter of 1946. There are also on order 1,500 all-steel box cars, delivery of which began in December, 1945. The acquisition of this equipment is part of the general rehabilitation program, in which the United States Railway Mission in Mexico has taken an active part, although its purchase will be for the exclusive account of the National Railways.

Imports and exports decreased materially, through all of the border gateways, except for a slight increase in imports through Brownsville and exports through El Paso. This does not mean that there was not more traffic available in both directions, since the problem has been insufficient motive power to handle the constantly increasing domestic traffic. There was a slight improvement in the utilization of available locomotives, freight locomotives having increased their kilometerage from 169 to 181 daily.

The following table indicates the general upward trends of traffic for the first seven months of 1945, and shows a total increase of 440,599 tons over the same period of 1944, the highest traffic record in the history of the National Lines.

Commodity	First seven months	
	1945 tons	1944 tons
Forest products	396,686	439,464
Agricultural products	2,096,817	2,082,146
Animals and animal products	174,378	170,068
Inorganic products	3,644,964	3,163,968
General Merchandise	821,250	837,840
Totals	7,134,095	6,693,496

Earnings Reach Highest Level

The enlarged traffic and a 25 per cent increase in general rates (excepting concentrates and minerals for the war effort) were responsible for a new high level in earnings of the National Railways of Mexico. Gross railroad earnings during the first eight months of

1945 amounted to 245,259,679 pesos as compared with 198,374,658 pesos in the same period of 1944, an increase of 23.63 per cent. Of this freight revenue increased from 120,444,023 pesos to 151,423,918 pesos; passenger income from 48,220,454 pesos to 54,931,882 pesos; baggage receipts from 104,932 pesos to 125,586 pesos; express earnings from 19,254,535 pesos to 22,776,156 pesos and miscellaneous revenues from 6,736,815 pesos to 8,888,246 pesos. Telegraph earnings decreased from 26,999 to 23,245 pesos. The total operating earnings increased from 194,787,748 pesos to 238,169,033 pesos, and other than operating revenues increased from 3,586,909 pesos to 7,090,645 pesos, the greater part of which represents rental of cars to other railroads in the country.

Total expenses increased 21.66 per cent, or from 182,360,283 pesos to 221,865,666 pesos, because of higher prices of materials but principally due to higher wages, the effect of the 30 million peso increase per year having been fully felt for the first time in 1945.

Maintenance of way expenses increased from 35,068,362 pesos to 43,444,503 pesos, or 23.89 per cent, during the periods referred to; mechanical department expenses increased from 54,335,523 pesos, to 69,058,028 pesos, equivalent to 27.10 per cent; traffic department expenses increased from 1,548,154 pesos to 1,772,873 pesos, or 14.52 per cent; transportation department expenses increased from 59,589,594 pesos to 70,430,055 pesos, or 18.19 per cent; express department expenses increased from 7,532,966 pesos to 9,525,146 pesos, or 26.45 per cent; miscellaneous expenses increased from 871,983 pesos to 985,570 pesos, equivalent to 13.03 per cent, and general expenses from 10,209,677 pesos to 12,478,952 pesos, or 22.23 per cent. The total operating expenses increased from 169,156,260 pesos to 207,695,128 pesos, or 22.78 per cent. Other than operating expenses increased from 13,204,023 pesos to 14,170,538 pesos, or 7.32 per cent, and total expenses increased from 182,360,283 pesos to 221,865,666 pesos, or 21.66

per cent. Increases in expenses were due to higher wages, higher prices and intensified maintenance and operation required by additional traffic needs.

Net earnings increased from 16,014,374 pesos to 23,394,013 pesos, or 46.08 per cent. These earnings are after taking into consideration depreciation and deferred maintenance of equipment and maintenance of way.

Ton-Kilometers Increase

Traffic handled by the National Railways, measured in ton-kilometers, increased 26,965,000 net, or 0.5 per cent, and 40,622,000 gross, or 0.4 per cent, during the first eight months of 1945 as compared with the same period of the previous year. Total locomotive kilometers increased from 27,364,309 to 27,383,569, or 0.1 per cent, whereas total train kilometers increased from 20,774,630 to 21,102,869, equivalent to 1.6 per cent; however, there was a decrease of 2,789,376 loaded freight car kilometers, while the empty car kilometers increased 4,569,917, or 6.6 per cent.

The accompanying table indicates that lighter trains were handled during the first eight months of 1945 as compared with the same period of 1944, both as regards net and gross tonnage. Speed of freight trains was reduced from 18.4 to 18.1 kilometers per hour, most of which is attributed to "blow downs" on road. Both of these factors brought about a decrease of from 16,580 to 16,198 gross ton-kilometers per train-hour. Cars moved a greater average distance; the haul increased from 45.0 to 49.7 kilometers per day, but the percentage of empty movements was greater. The number of cars loaded increased from 337,554 to 338,860, but considerable delays were experienced both on road and in terminals. The only operating factors that show improvement are the number of net tons loaded per car, which increased from 29.9 to 30.5, and the number of kilometers made daily by locomotives, which rose from 169 to 181.

Higher material, but especially higher labor costs, and the run-down condition of the locomotives, affected car and locomotive repair costs seriously. Labor, per 1,000 kilometers run, for coach repairs increased from 33.12 to 47.74 pesos, or 44.1 per cent; materials costs increased from 20.20 to 26.14 pesos, equivalent to 29.4 per cent. Freight car repairs increased from 30.38 to 44.01 pesos per 1,000 kilometers run for labor, or 44.9 per cent, and from 27.30 to 38.51 pesos for materials, or 41.1 per cent. Backshop repairs, labor, increased from 310.00 to 449.47 pesos, and materials from 182.51 to 199.40 pesos, or 9.3 per cent; and running repairs, labor, increased from 235.55 to 300.61 pesos, or 27.6 per cent, while material costs rose from 113 to 157 pesos, 38.8 per cent.

Selected Operating Statistics (First 8 Months 1945—1944)

	1945	1944		Increase or Decrease	Percent Change
Locomotive klms.	27,383,569	27,364,309	I	19,260	0.1
Freight train klms.	11,367,724	11,210,057	I	157,667	1.4
Passenger train klms.	6,484,645	6,249,591	I	235,054	3.8
Mixed and spec. klms.	3,027,281	3,069,981	D	42,700	1.4
Non-revenue train klms.	223,219	245,001	D	21,782	8.9
Total train klms.	21,102,869	20,774,630	I	328,239	1.6
Passenger car klms.	63,498,736	62,138,159	I	360,577	2.2
Frt. loaded car klms.	176,813,438	179,602,814	D	789,376	1.6
Frt. empty car klms.	74,151,648	69,581,731	I	569,917	6.6
Total freight car klms.	250,965,086	249,184,545	I	780,541	0.7
Net ton-klms. (1,000s)	5,383,786	5,356,831	I	26,955	0.5
Gross ton-klms. (1,000s)	11,504,065	11,463,443	I	40,622	0.4
Total number cars loaded	338,860	337,554	I	1,315	0.4
Net tons per train km.	443	445	D	2	0.4
Gross tons per train km.	895	901	D	6	0.7
Speed per hr. (klms.) frt.	18.1	18.4	D	0.3	1.6
Gross ton-klms. per train hr.	16,198	16,580	D	382	2.3
Frt. loc. klms. daily	181	169	I	12	7.1
Liters oil per 1,000 GTK—frt.	47.2	47.7	D	0.5	1.0
Percent loaded car klms. to total	70.5	72.1	D	1.6	2.2
Car klms. per car daily	49.7	45.0	I	4.7	10.4
Net tons per car	30.5	29.9	I	0.6	2.0
Cars on line daily	22,113	22,680	D	567	2.5
Klms. line operated	11,734	11,740	D	6	0.1

Railway Operations in 1945

By **DR. JULIUS H. PARMELEE**
Director, Bureau of Railway Economics

CONCLUSION of the two wars that held the world within their devastating grip for nearly six years was the outstanding development of the year 1945. Unconditional surrender of the German armed forces in May (V-E Day) was followed three months later, in August (V-J Day), by the unconditional capitulation of Japan. The termination of the two wars was not wholly unexpected, but both came with some abruptness and somewhat closer together than had been anticipated.

1945 Had Three Phases

From the standpoint of American industry, therefore, the year 1945 was one of three distinct phases, namely: (1) 4½ months of a two-front war, in Europe and in the vast reaches of the Pacific Ocean, (2) 3 additional months of concentrated effort against the Japanese, and (3) 4½ months of peace. The railroad industry was particularly affected by the different conditions prevailing in these three periods.

The year opened with record snows in certain Northeastern states. These unfavorable weather conditions prevailed throughout January and February and, together with persistent manpower shortages, led to the most critical railroad operating conditions of the entire war period. Notwithstanding these conditions, the railroads established new records for unloads of war materials at the ports in the first two months of the year and went on to new highs in March and April. Thereafter, the decline in unloads at Atlantic ports more than offset the increases during May and June in unloads at West Coast ports.

Following V-E Day, war activities in the Pacific area were greatly intensified. This involved sharp increases in war goods moved to West Coast ports, as well as stepped-up movements of troops and naval personnel, all requiring long hauls. Unloads at West Coast ports in May and June were 21 per cent greater than the previous highs established during March and April. Extensive plans were laid for bringing troops home from Europe as rapidly as available boats would permit. Many of these veterans, after a short furlough at home, were to undergo a short course of training for combat in the Pacific and then proceed to that area. The railroads responded quickly to the necessary changes in operations, and by increasing assign-

Maintaining the high standard of their remarkable war performance, the railroads met successfully the radically changing conditions precipitated by V-E and V-J Days and the beginnings of reconversion, with the return to peace. Railroad prosperity depends on national prosperity and a high rate of production. Beseet with complicated problems involved in reconversion and with the prospects of keen competition, the railroads are determined to maintain their position as the one indispensable mass transportation agency.

ments of passenger equipment to exclusive military service were meeting their new obligations fully at the time Japan surrendered.

V-J Day brought new problems. Only a small part of the huge task of bringing men home from Europe had been accomplished. Another five months were needed to get the bulk of the job done. Meanwhile, reversal of the movement of men to West Coast ports was imminent and plans had to be revised to provide for that movement. A new high in organized troop movements was recorded in August, both in terms of men and miles. By the year's end the demands for movement of Army and Navy personnel had reached a new peak, topping even that of August.

Grain Movement

In freight service, heavy movements of grain continued at record levels after V-J Day, stimulated by the large export program designed to provide food for the war-ravaged areas of Europe. Live-stock shipments by rail, which were considerably increased during the war as a result of truck shortages, were unaffected by the end of the war and remained at high levels. Except for a period of three weeks in October when labor difficulties materially reduced output, coal movement showed little change following V-J Day. Seriously reduced coal stocks, as well as an export program to needy Europe, maintained the demand for coal at wartime levels.

On the other hand, the movement of

ore, coke, forest products and manufactures declined sharply. Tankers returned to the Gulf-Atlantic and other routes, and the rail movement of petroleum to the East and West coasts declined rapidly towards prewar levels. The average length of haul per ton for total traffic began to shorten.

The net result of the year's operations showed a decline of about 3½ per cent in freight carloadings, a decrease of about 8 per cent in ton-miles, and a drop of about 5 per cent in passenger-miles. From an operating standpoint, however, the year offered many difficult problems, perhaps more varied than in any other war year. Manpower and materials shortages, bad weather conditions, limited equipment supply, and sharp changes in transportation requirements were the principal factors in this situation.

From a financial viewpoint, the year was characterized by declining operating revenues following V-J Day and by increasing operating expenses throughout the year. Net earnings declined for the third successive year, producing a rate of return of only about 3½ per cent on property investment.

Labor's Share

Both employment and payrolls were greater in 1945 than in 1944. The average number of employees increased about one-half of 1 per cent, while the total payroll increased nearly 2 per cent. Pending demands for increased wage rates and changes in working rules would, if granted in full, result in an aggregate estimated cost of more than two billion dollars per year, based on current levels of employment.

Except for passage of the Land Grant Bill, no major legislation was enacted directly affecting railroads. A number of bills, however, were introduced in Congress and are pending, some of which are of vital importance to the future of rail transportation.

One large railway company emerged from trusteeship, while one small company went into trusteeship. Another small company was discharged from receivership.

During the war the railroads handled "the greatest mass movement of men and materials in all the history of mankind." They moved about 90 per cent of all war freight, and about 97 per cent of the personnel of the armed serv-

ices moving in organized groups. This part of the railroad war job will not be completed until some time after mid-year of 1946.

Physically, the railroads are emerging from the war period in fairly good condition. There is much deferred maintenance work to be done, but the roads are not under-maintained from the standpoint of safety. There is also a considerable amount of delayed capital improvement work which could not be carried out during the war, but which undoubtedly will be undertaken on a considerable scale in the immediate post-war years. These improvements will enable rail carriers to render even better service and do a more efficient job of operation.

Research looking toward a continuation of progress in technology which made possible the unparalleled war performance of the railroads is going ahead vigorously on all fronts. The public will see some of the results in 1946, and much more in succeeding years.

Principal uncertainties of the future are in traffic trends, rates, and operating costs. Railroad freight rates are no higher than they were five years ago, and about one-fourth below what they were 25 years ago. Although an increase of 10 per cent in passenger fares was authorized in 1942, it will automatically expire six months after the official ending of the war.

Stable Rates

This stability of rates was maintained in recent years even though there were increases in railroad wages in 1941 and again in 1943, averaging some 28 per cent, and also increases in the prices of railroad materials and supplies since Pearl Harbor averaging about 24 per cent. Despite these increases in wage and price levels, the railroads went through the war on a prewar rate basis because the ever-increasing volume of traffic they handled enabled them to operate at far greater plant capacity.

Funded debt and fixed charges continued to be reduced by substantial sums in 1945, the purpose of such reduction being to strengthen the financial structure of the railroad industry against the financial uncertainties of the postwar period.

With traffic on the decline, the railroads now have before them insistent demands for further increases in wage rates, even greater than the combined increases granted in 1941 and 1943. Railroads also face the prospect of higher payroll taxes for retirement benefits, and possibly further increases in the level of prices.

Another unfavorable factor is the imminent restoration of competition on a prewar scale. Some of the traffic that shifted from other modes of transport

to the railroads has already gone back to prewar methods of handling. Other traffic will follow when boats return in number to intercoastal and coastwise routes, when trucks begin to roll from assembly lines, and when new planes take to the air.

These are the major problems which confront the railroads in the readjustment and postwar periods. However, the industry is determined to use all possible means to meet these difficulties, to improve its services to the public, and to increase the efficiency and economy of operations.

Office of Defense Transportation

The Office of Defense Transportation continued its efforts to obtain maximum results in the field of domestic transportation. Col. J. Monroe Johnson, a member of the Interstate Commerce Commission, continued as O. D. T. Director, and of his own volition began curtailment of the agency's activities as soon as the war with Japan came to a close, including demobilization of the staff and gradual revocation of O. D. T. orders governing freight and passenger operations. June 30, 1946, is the tentative date for final liquidation of all O. D. T. activities. At the close of the year 1945 the agency had a force of only 90 employees, most of whom are located in Washington, compared with approximately 4,900 employees in 1944.

In addition to controls instituted in 1944 and prior years, the O. D. T. in February, 1945, placed certain restrictions in effect designed to cut down civilian travel. Voluntary cancellations of conventions was first sought, and a later order limited group meetings to a maximum of 50 persons from out of town, except by special permission. Between February and October, 1945, when the order was revoked, 4,095 conventions applications were received and reviewed, but only 495 permits were issued.

Due to heavy movements of returning soldiers from both theatres of the war, the O. D. T. eliminated as of July 7 sleeping car runs of less than 450 miles, shortened reservation time to five (later to 14 days, and made available additional passenger coaches for military use.

In August and September orders were revoked which prohibited various special train services, such as seasonal resort schedules, and the use of private cars. In August, also, as the result of a labor dispute O. D. T. took over the Illinois Central Railroad, but the only change in personnel was to place a federal manager in charge. That situation remained unchanged at the close of the year.

In October, the Toledo, Peoria & Western Railroad, which had been oper-

ated by O. D. T. since early in 1942 because of labor troubles, was restored to private control. However, reopening of the old labor dispute prevented prompt renewal of operations under private management.

In cooperation with the Association of American Railroads, the Army and other agencies, O. D. T. participated in recruitment campaigns to relieve the railroad manpower shortage. Especially did the acute labor shortage on western railroads engage O. D. T. attention.

The O. D. T. was also active in various problems arising in connection with the operation of other forms of transport—commercial trucks, waterways and private conveyances. Lifting of O. D. T. controls over all forms of transportation came rather rapidly after V-J Day. These controls included the return to private operation of more than 100 midwest trucking companies which had been taken over as a result of labor disputes.

Under the War Production Board Controlled Materials Plan, O. D. T. served as claimant agency for the transportation industry. As such, the agency, from its inception on December 18, 1941, to June 30, 1945, obtained authorization of materials for the production of 1,082 steam, 1,741 Diesel electric, and 38 electric locomotives, 155,002 freight cars, 1,200 troop sleepers and 400 kitchen cars, 181,146 trucks and tractors, 19,580 integral buses, and 5,572,392 tons of replacement rail.

Railroad Retirement Board

The number of beneficiaries on the retirement rolls of the Railroad Retirement Board increased sharply in 1945. From a total of 166,434 as of October 31, 1944, the total number increased to 174,390 as of the same date in 1945, a net increase of 7,956. This net increase resulted from an increase of 10,548 in the number of annuitants awarded under the Act and a decline of 2,592 in the number of pensioners (persons transferred from the voluntary rolls of the carriers in 1937) by reason of deaths among that group.

The sharp rise in number of beneficiaries is illustrated by the following tabulation:

	1945 over 1944	1944 over 1943	1943 over 1942
As of October 31:			
Increase in annuitants . . .	10,548	7,495	7,170
Decrease in pensioners . . .	2,592	3,293	3,221
Net increase	7,956	4,202	3,949

The increase in benefit disbursements in 1945 was likewise greater than in any previous year. Total benefit disbursements during October, 1945, amounted to \$12,435,717, which represented an annual level of \$149,229,000. This was \$8,141,000 above the annual level prevailing in October, 1944. The cor-

responding increase, October, 1944, over October, 1943, was \$6,437,000.

Continued high employment during the greater part of 1945 was reflected in retirement tax accruals which remained at substantially the same level as in 1944. For the first 10 months of 1945, these amounted to \$100,554,000, compared with \$100,321,000 for the corresponding period of 1944.

The following tabulation summarizes retirement tax accruals, interest, and expenditures for the period of operation from 1937, when the Railroad Retirement Act became effective, to October 31, 1945:

Tax accruals	\$1,590,000,000
Interest	42,704,003
	\$1,632,704,003
Less:	
Benefit payments \$1,014,842,029	
Administrative expenses	24,748,423
	1,039,590,452
Balance	\$593,113,551

The foregoing balance does not represent the actual balance to the credit of the Railroad Retirement Account, inasmuch as transfers to that account from Congressional appropriations rather than tax collections are considered basic assets, and administrative expenses are not charged against the fund but are met from appropriations by Congress for that specific purpose. The actual balance as of October 31, 1945, was \$670,462,973 of which \$668,500,000 was invested in 3 per cent Treasury notes.

Jobless Pay

Railroad Unemployment Compensation. The number of railroad unemployment compensation benefits certified (for periods of 14 days each) during the first eight months of 1945 totaled 21,413, compared with 14,215 during the same period of 1944. Disbursements on account of those benefits amounted to \$571,243 and \$376,281, respectively. Thus, unemployment benefit disbursements during the first eight months of 1945 were about 50 per cent greater than those of the same months of 1944.

Coincident with a decline in railroad employment in September, 1945 (the first complete month of peace), unemployment benefits rose in that month to about three times the number in September, 1944, and in October, 1945, rose to more than seven times the number in October, 1944. A comparison of unemployment benefits for the first eight months of 1945, and of September and October, 1945, with the same months of 1944 is shown below:

	First 8 months	Sept. and Oct.
	Benefits Amounts	Benefits Amounts
1944	14,215 \$376,281	3,157 \$86,352
1945	21,413 571,243	17,311 455,455
Per cent inc. ...	50.6 51.8	448.3 427.4

Although current railroad unemployment compensation benefits give indication of rising substantially above those of the wartime years, with full employ-

ment, they are yet relatively small when compared with taxes assessed under the Railroad Unemployment Insurance Act.

Unemployment insurance tax accruals for the first ten months of 1945 amounted to \$92,847,000, compared with accruals of \$92,604,000 for the same period of 1944. The large excess of taxes over disbursements further swelled the balance to the credit of the unemployment insurance reserve, which amounted to \$678,661,831 as of October 31, 1945.

The following tabulation is a summary of the financial results of operation of the unemployment insurance system, for the entire period of operations from July 1, 1939, to October 31, 1945.

July 1, 1939, to Oct. 31, 1945	
Receipts:	
Net tax contributions	\$532,138,078
Transfers from state accounts	106,542,390
Transfers from administrative funds .	47,648,850
Interest on investments	37,338,001
	*\$723,667,369
Expenditures:	
Net benefit payments	\$44,998,349
Reimbursements to states	17,189
	45,005,538
Balance or reserve	\$678,661,831

* Includes \$50 in fines and penalties collected.

The net contributions shown in the foregoing summary represent 90 per cent of the total tax collections, the remaining 10 per cent being transferred to an administrative fund. Administrative expenses for the entire period of operation, from July 1, 1939, to October 31, 1945, including expenditures on account of employment service operations, amounted to \$21,807,857.

Placements made by the Railroad Retirement Board's employment service averaged 137,389 during the first eight months of 1945, but dropped to an average of 69,042 in September and October, the latest complete postwar months for which information is available. Removal of manpower controls after V-J Day, with elimination of clearance requirements, was largely responsible for this reduction. Demand for workers, however, especially laborers, continued strong.

R. C. C. and R. F. C.

The final distribution of the year on the fund set up by the R. R. Credit Corp. in 1931, was made November 30, and amounted to \$362,134. This brought the total amount distributed to \$70,082,396, or 95½ per cent of the original fund contributed by carriers participating in the Marshalling and Distributing Plan. Of the total distributed so far, \$41,342,697 was in cash and \$28,739,689 in credits on loans.

As of November 30, 1945, indebtedness of rail carriers to the government as a result of loans by the Reconstruction Finance Corporation and the Public Works Administration was as follows:

Total loans (RFC and PWA)	\$1,053,675,675
Repaid by railroads and/or sold to public by RFC	844,879,892
Balance due government	\$ 208,795,783

Exclusive of disposal of P. W. A. securities to the public, the R. F. C. has realized a profit of approximately \$6,400,000 from the sale of \$242,600,000 worth of railroad securities to the public.

Bankrupts

Seventy-five railroad companies, operating 39,858 miles of road, were in the hands of receivers and trustees at the end of 1945—one less than on December 31, 1944. Of the total number in the hands of the courts, three Class I and eleven smaller companies were in the hands of receivers, while 21 Class I and 40 smaller companies were in the hands of trustees. There were only three changes in the situation during the year.

The St. Johnsbury & Lake Champlain Railroad, which operates 96 miles of road, went into trusteeship, the Bowdoin Railway, operating 12 miles of road, came out of receivership; the Chicago, Milwaukee, St. Paul & Pacific, operating 10,723 miles of road, was discharged from trusteeship on December 1.

Railroad Radio

On January 16, 1945, the Federal Communications Commission assigned to the railroads 33 clear radio channels in the 156-to-162 megacycle band, with the privilege of sharing other channels in the television and other bands. On September 20 the Commission agreed to waive its requirement, so far as railroads are concerned, that the initial application for radio authorizations be accompanied by a copy of the articles of incorporation certified by the Secretary of State for the state in which the particular railroad company is incorporated, and accepted, in lieu of this requirement, a list of member roads of the Association of American Railroads.

Employment and Wages

Average employment in the railroad industry increased from 1,414,776 in 1944 to 1,422,000 in 1945, an increase of one-half of 1 per cent.

The total railway payroll amounted to \$3,858,000,000 in 1944. It increased to \$3,925,000,000 in 1945, an increase of \$67,000,000, or 1.7 per cent, over 1944. The aggregate payroll for 1944 was the largest in railroad history, but the payroll for 1945 again broke the record. With an employment in 1945 of 600,000 fewer workers than in 1920, the payroll of 1945 was \$243,000,000 greater. This emphasizes the increased rates of pay granted to railroad workers between

1920 and 1945, and the increased work opportunities extended to individual workers in 1945.

Annual earnings of railway employees reached a peak of \$2,760 per man in 1945, compared with \$2,727 in 1944, and with \$1,820 in 1920.

The straight time rate of pay of railway employees averaged 93.3 cents per hour in 1945, was 93.0 cents per hour in 1944, and 65.8 cents per hour in 1929.

Table I shows, for 1945, for the preceding six years, and for 1929, the average number of employees, total payroll, compensation per employee per year, and average hourly straight time rate of pay.

Table I—Employees and Compensation

Year	Average number	Total payroll millions	Compensation per employee per year	Average hourly straight time rate (cents)
1945*	1,422,000	\$3,925	\$2,760	93.3
1944	1,414,776	3,858	2,727	93.0
1943	1,355,114	3,521	2,598	89.3
1942	1,270,687	2,932	2,307	83.5
1941	1,139,925	2,332	2,045	76.9
1940	1,026,848	1,964	1,913	74.2
1939	987,675	1,863	1,887	74.0
1929	1,660,850	2,897	1,744	65.8

During the summer and fall of 1945 twenty standard railroad labor unions made demands for wage increases and changes in working rules. These demands were the subject of conference between employee and carrier representatives, and in mid-December the carrier representatives invoked the services of the National Railway Mediation Board.

The current demand of the fifteen non-operating unions, which includes shopmen, clerks, maintenance workers, and other classifications of non-operating employees, is for a wage increase of 30 cents an hour.

What the Brothers Want

The demands of the five operating organizations, conductors, trainmen, engineers, firemen, and switchmen, is for a minimum wage increase of \$2.50 in all existing basic daily rates. The engineers and trainmen organizations are further demanding that all existing basic daily rates, in excess of \$10.00, be increased 25 per cent. In addition, the five operating brotherhoods have proposed more than 50 changes in working rules.

The wage demands alone, calculated on the basis of 1944 employee service hours, would amount to an increase in the payrolls of the nonoperating group of employees of \$874,000,000 per year, and for the operating group of employees an increase of \$331,000,000 per year, a total wage increase demand of \$1,205,000,000 per year, not taking into account increased payroll taxes on increased payrolls.

Including the proposed rule changes of the five operating organizations, the over-all demands of the employee representatives would add more than \$2,000,-

000,000 annually to railroad operating costs.

Rates and Fares

There were no changes during 1945 in the general level of freight rates or passenger fares. By decision handed down by the Interstate Commerce Commission in December, 1944, freight rate increases authorized in Ex Parte 148 were continued in suspension until January 1, 1946. These increases, amounting to between 4 and 5 per cent on the average, were in effect from March 18, 1942, to May 15, 1943, and have been

suspended since the latter date. The 10 per cent passenger fare increases authorized in the same proceeding, effective February, 1942, have continued in effect.

On October 30, 1945, the Commission issued a further order suspending the freight rate increases "until a date six months after the legal termination of the war." The passenger fare increases will expire, by limitation, on the same date. That date has not yet been determined.

Table II shows the average revenue per ton-mile and per passenger-mile for the first nine months of 1945 and for certain prior years.

Table II—Revenue per Traffic Unit

Year	Per ton-mile (cents)	Per passenger-mile (cents)
1929	1.076	2.808
1939	.973	1.839
1940	.945	1.754
1941	.935	1.753
1942	.932	1.916
1943	.933	1.882
1944	.949	1.874
1945 (9 mos.)	.968	1.880

Average revenue per ton-mile in the first nine months of 1945 was 0.968 cent, or 2 per cent above the 1944 average. It was the third successive year of increase in the average, even though there was no increase in the general level of rates during the period. The growing proportion of finished goods, representing war materials and supplies, largely accounted for the increase in revenue per ton-mile. This proportion is already declining.

Average revenue per passenger-mile was about the same in the first nine months of 1945 as in 1944 and 1943—1.88 cents. The comparatively heavy volume of service men and women carried at reduced furlough fares had an important effect on the average during the war period.

On May 15, in Docket 28300, Class Rate Investigation, 1939, and Docket 28310, Consolidated Freight Classification, the Interstate Commerce Commission set November 30, 1945, as the date for carriers to carry out its order, as an interim measure, to increase class rates in official territory by 10 per cent and reduce class rates in other territories east of the Rocky Mountains by 10 per cent. They also required the railroads to establish later a uniform freight classification in all parts of the United States, and effective concurrently with such uniform classifications to establish a uniform scale of class rates in territories east of the Rocky Mountains. The effective date of the interim adjustment was later extended to January 1, 1946.

On December 21, 1945, the Federal District Court in northern New York granted an interlocutory injunction enjoining the enforcement of the Commission's order. The injunction was sought originally by nine northeastern states, but as issued by the court applies to the entire country. At the time of going to press, the Interstate Commerce Commission had just issued an order staying the effective date of the changes in class rates.

Legislation Passed and Pending

The 79th Congress, first session, convened on January 2, 1945, and except for adjournment of the House of Representatives between July 21 and September 5, remained in session until December 21.

The only major legislation of direct concern to the railroads was passage of the Boren Land Grant Bill (Public Law 256), repealing the reduced rate provisions of the several Land Grant Acts, some of which have been in effect since 1850. The final House vote on the conference report was 159 to 44, the Senate having previously approved the measure by a majority vote. The President signed the measure on December 12, and its provisions become effective October 1, 1946.

The following legislation introduced but not finally acted upon in the 1945 session of Congress is of direct or collateral interest to railroads.

H. R. 1362 and S. 293—To amend the Railroad Retirement and Unemployment Compensation Acts. Both bills propose radical changes in the present railroad retirement and unemployment insurance systems, including a new system of annuities for survivors of railroad employees and a new feature embodying non-occupational sickness and accident insurance. Hearings on H. R. 1362 consumed 31 days between January 31 and April 26, and hearings on S. 293 were held from July 23 to 26. At the close of the year no report had been

made by either committee in charge of the bill.

H. R. 2536 (Bulwinkle bill)—To stay the operation of anti-trust laws with respect to agreements between carriers which have been approved by the Interstate Commerce Commission. The purpose of the bill is to clear up the uncertainty and confusion concerning the application of anti-trust laws as they relate to railroads. The bill was passed by the House on December 12 and referred by the Senate to the Committee on Interstate Commerce.

H. R. 54 and H. R. 92—To provide for investigation of marketing, transportation and distribution of food and allied products.

H. R. 2788—To limit to one year the period for filing suits arising under federal statutes that contain no limitation provision.

S. 432—Extension of period of limitations for recovery of overcharges.

H. R. 77—To amend Section 77 of the bankruptcy act, restricting the power of the Interstate Commerce Commission to reduce the capitalization of railroads reorganized under that statute.

H. R. 318, S. Res. 161 and S. Res. 168—To investigate the national transportation system. Resolutions to that effect were introduced by Representative Lea of California, Senator McFarland of Arizona, and Senator Mead of New York. No hearings have been held on the bills, each of which provides for a comprehensive investigation of the whole transportation situation.

S. 1349—To amend the Fair Labor Standards Act by raising the minimum wage in industry (including the railroads) to 65 cents an hour, and later to 70 and 75 cents. It also provides that a reasonable wage differential be maintained between the minima prescribed and interrelated job classifications. A number of other bills (including H. R. 4130, H. R. 3179, H. R. 3844 and H. R. 3914) embody similar proposals. Hearings were held in 1945 before both Senate and House Committees.

Outlays for Airports

S. 1, S. 2, S. 34, and H. R. 674—To authorize expenditures ranging up to more than a billion dollars on new and existing airports and airport facilities. Numerous hearings have been held on these bills, and further testimony is to be heard.

A special report of the Civil Aeronautics Administration, submitted to Congress November 28, 1944, has support in S.2, which has already passed the Senate and was referred to conferees of the House and Senate on November 1. The bill authorizes a federal appropriation of \$100 million a year for five years, when matched by an equal amount of state and city funds.

Court Decisions and Actions

Seatrail Case. On January 29 the Supreme Court upheld the Interstate Commerce Commission, holding that railroads participating in through rates with Seatrain Lines, Inc., must interchange cars with that carrier and collect from it only the regular per diem and only "for such period as the cars are in its actual possession."

Georgia Rate Case. On March 26, by a 5 to 4 decision, the Supreme Court assumed original jurisdiction and granted the state of Georgia the right to file a bill of complaint alleging violation of the federal anti-trust laws. The case is now at issue and expected to be heard early in 1946 by Lloyd K. Garrison, chairman of the War Labor Board, who was appointed Special Master by the Supreme Court on December 17. He is directed to submit his findings of fact and conclusions of law to the court, along with a draft of a recommended decree.

Railroad Anti-Trust Suit. On September 27 Federal District Judge Delehant in Lincoln, Nebraska, denied the motion of the Association of American Railroads, the Western Association of Railway Executives, and certain individual western roads to dismiss the government's anti-trust suit instituted in 1944. The motion for a bill of particulars was denied in part and sustained in part. Motion to strike out parts of the government's complaint were denied. On December 3 Judge Delehant fixed March 3, 1946, as the date for filing the bill of particulars.

Ex Parte 148—Intrastate Passenger Fare Cases. The validity of an order by the Interstate Commerce Commission requiring intrastate railroads to increase their passenger fares to the level of interstate fares, as established by the Commission in its Ex Parte 148 proceedings, was in question. The Supreme Court by a 5 to 4 decision on June 11 held that the Commission's order was "not based on adequate findings supported by evidence." The cases involved North Carolina vs. United States, and Alabama vs. United States. The affected railways were told by the Court that if they considered fares uneconomic or unjust, their proper course was to make an application on that basis supported by evidence, rather than to request that fares be maintained on a uniform level throughout the country.

Arizona Train Limit Law Held Unconstitutional. On June 18 the Supreme Court held that the Arizona Train Limit Law was unconstitutional on the ground that it was in contravention of the commerce clause of the Constitution. The Court's discussion in this case of the constitutional doctrine concerning the power of the State to affect or regulate interstate commerce, in the absence of

congressional action, was perhaps the clearest and most comprehensive treatment of this difficult subject which the court has ever undertaken. The train limit law was passed by the Arizona Legislature in 1912.

Pullman Anti-Trust Suit. On December 18 a Special Federal Court in Philadelphia approved the offer of 52 railroads to buy the sleeping car business of the Pullman Company. The court found that there is "no danger of a perpetuation of monopoly in a railroad-owned sleeping car business." However, three conditions were imposed on the purchasers, as follows:

1. No interlocking directorate between Pullman-Standard Car Manufacturing Co., Pullman, Inc., and the railroads.

2. The new company must buy new cars under competitive bidding.

3. Individual railroads purchasing new sleeping cars must also do so under competitive bidding.

The 52 railroads asked the court to direct the Pullman Company to continue operations until March 31, 1946. The request specified that operations beginning January 1, 1946, would be for the account of the buying group.

Traffic Trends

Statistics for 1945 in this review are in most instances preliminary, and consequently subject to revision when final figures become available. Unless otherwise indicated, all statistics relate to railways of Class I. Generally speaking, the statistics are derived from reports of the Interstate Commerce Commission. Carloading statistics, and certain other statistics, the sources of which are specifically indicated, are based upon records of the Association of American Railroads.

Table III shows on a comparative basis statistics of revenue freight and passenger traffic for 1945, 1944, and certain earlier years.

Table III—Comparative Traffic Statistics

Revenue Carloadings (thousands)			
1945.....	42,000	1940.....	36,358
1944.....	43,441	1939.....	33,911
1943.....	42,440	1933.....	29,220
1942.....	42,771	1929.....	52,828
1941.....	42,352	1918.....	44,592
Revenue Ton-Miles (millions)			
1945.....	680,000	1940.....	373,253
1944.....	737,246	1939.....	333,438
1943.....	727,075	1933.....	249,223
1942.....	627,984	1929.....	447,322
1941.....	475,072	1918.....	405,379
Revenue Passenger-Miles (millions)			
1945.....	91,000	1940.....	23,762
1944.....	95,549	1939.....	22,651
1943.....	87,820	1933.....	16,341
1942.....	53,659	1920.....	46,849
1941.....	29,350	1918.....	42,677

Revenue Carloadings. Total carloadings of revenue freight in 1945 aggregated 42,000,000 cars, which was a decrease of 1,441,000 cars, or 3.3 per cent,

below 1944. The decrease in carload traffic was 4.1 per cent, while L. C. L. shipments showed an increase of 2.2 per cent.

Loadings for each of the eight general commodity groups are shown in Table IV, together with the increase or decrease below 1944. Loadings for the last two weeks of 1945 are estimated.

group, showed a fairly even trend in the three periods, and were off about 7 per cent for the year as a whole. Had it not been for the slow down in coal production during the first three weeks in October, as a result of labor difficulties, coal loadings for the period following V-J Day would have been close to those for the same weeks of 1944. Coke,

through May, representing roughly the two-war period; the three months of June through August representing the one-war period; the four months, representing the period of peace. The table includes a comparison with the corresponding periods of 1944.

Table V—Railroad Ton-Miles (millions)

	1945	1944	Per cent decrease
January-May	302,357	306,851	1.5
June-August	180,119	188,710	4.6
September-December	197,659	241,842	18.3
Year	680,000	737,246	7.8

(Note: Annual totals include adjustments)

The effect of the gradual termination of hostilities on two fronts, as exemplified by railroad freight traffic, is strikingly shown in these figures. Ton-miles decreased 1½ per cent to V-E Day, 4½ per cent between V-E Day and V-J Day, and 18 per cent thereafter.

Chart A shows the monthly trend in ton-miles during 1945 and 1944. The first two months of 1945 were affected by severe weather conditions in the northeastern states and ran about 6 per cent below the same months of 1944. Each of the next four months showed a slightly greater volume of freight traffic than in the corresponding month of 1944, while each of the last six months showed a decrease, and at an accelerating rate.

Travel Trend

The effects of V-E Day and V-J Day are also evident from this chart.

Passenger-Miles. Passenger-miles also showed a decline in 1945, although the monthly trends during the year were practically the reverse of the ton-mile pattern. Passenger-miles for the year aggregated 91 billions, or about 5 per cent below the record level of 1944.

Table VI is a distribution of total passenger-miles in 1945 over the same three periods as in Table V, compared with the corresponding periods of 1944.

Table VI—Railroad Passenger-Miles (millions)

	1945	1944	Per cent decrease
January-May	35,287	38,633	8.7
June-August	24,401	25,710	5.1
September-December	31,367	31,233	0.4
Year	91,000	95,549	4.8

I—Increase.

(Note: Annual totals include adjustments)

Having in mind the accelerating rates of decrease in freight ton-miles, as previously shown, passenger-miles showed a reverse trend. From January through May, a decrease of 8.7 per cent occurred; from June through August, the rate of decline was 5.1 per cent; but from September through December, an increase of 0.4 per cent took place.

The increasing trend toward the close of the year was almost wholly the result of the heavy demobilization of troops, which was accelerated beyond the original program, and which brought more

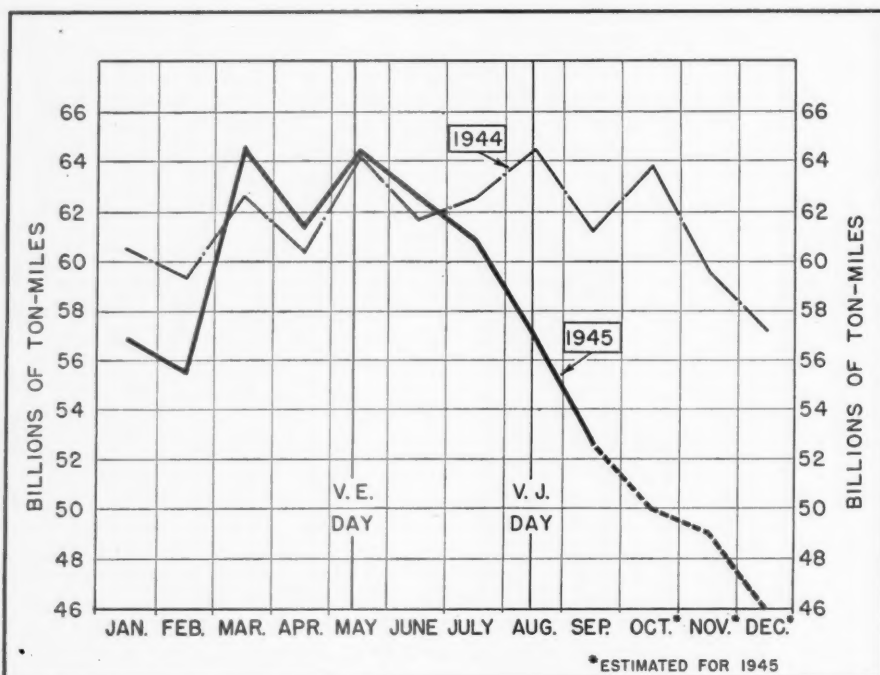


Chart A—Revenue Ton-Miles, by Months, for Class I Railways, 1944 and 1945

Two commodity groups (grain and L. C. L.) showed increases in 1945 over 1944, while another group (livestock) was about the same in the two years. In the case of each of these three groups, substantial increases occurred following V-J Day. Grain loadings for the year established a new all-time high.

ore, and forest products loadings showed substantial declines following V-J Day.

Revenue Ton-Miles. Tons of revenue freight carried one mile approximated 680 billion in 1945, a decline of nearly 8 per cent below 1944. The rate of decline in ton-miles was more than double that of loadings, due in part to reduced

Table IV—Carloadings by Commodity Groups

	1945 (000)		Decrease below 1944 number (000)		Per cent
Grain and grain products	2,750	I	229	I	9.1
Merchandise, l.c.l.	5,545	I	122	I	2.2
Live Stock	892				
Miscellaneous	19,310		685		3.4
Ore	2,475		174		6.6
Coal	8,313		625		7.0
Coke	695		56		7.4
Forest Products	2,020		252		11.1
Total	42,000		1,441		3.3

Each of the remaining five groups of commodities showed substantial declines in loadings during the year 1945, ranging from 3.4 per cent for miscellaneous to 11.1 per cent for forest products. The miscellaneous group, which comprises nearly half of the total, showed an increase of nearly 4 per cent up to V-E Day, declined by nearly 1.5 per cent between V-E Day and V-J Day, and dropped sharply by about 12.5 per cent following V-J Day. Coal loadings, which represent the second largest

length of hauls following V-J Day and in part to changes in the distribution of commodities handled. During the war period, the average haul per ton increased from 351 miles in 1940 to 473 miles in 1944, or by more than one-third. The influence of war factors in this regard began to subside following V-J Day, but a number of months will elapse before they are entirely eliminated.

Table V is a distribution of total ton-miles in 1945 over the three periods already referred to—the five months

than a million men a month to East and West coast ports for discharge and transfer home.

Table VI and Chart B show the monthly trends of passenger-miles in 1945 and 1944. Each of the first nine months of the year showed a decline below the corresponding month of 1944, ranging from about 3 per cent in January to more than 14 per cent in April. October passenger-miles for the two years were about the same, but November and December, 1945, each showed increases. The movement of returning veterans from Europe and the Pacific as already indicated, reached its 1945 peak in those two months.

Equipment and Materials

The statistics in this section are based, for the most part, on A. A. R. records.

Due to continuing shortages in basic materials and in manpower, railroad programs for new equipment and steel rail in 1945 were not fulfilled. It was the fourth successive year in which deliveries failed to reach the minimum goals set at the beginning of the year.

Programs and deliveries for each of the four war years are shown in Table VII. The equipment statistics apply to the 12-month periods ended September 30, while the rail statistics are for calendar years.

Table VII—New Equipment and Rail

	Locomotives (number)	Freight Cars (number)	Steel Rail (net tons)
1945—Program ..	995	50,000	2,900,000
—Deliveries ..	677	43,256	1,900,000
1944—Program ..	1,200	50,000	2,600,000
—Deliveries ..	1,011	34,432	1,900,000
1943—Program ..	878	80,000	2,100,000
—Deliveries ..	620	27,360	1,500,000
1942—Program ..	974	113,594	1,632,000
—Deliveries ..	783	80,874	1,280,000

From a relative standpoint, the locomotive program in 1945 was not met by about one-third; the freight car program fell short by 15 per cent; the steel rail program was not fulfilled by one-third, or 1,000,000 net tons. Compared with 1944, deliveries of new freight cars in 1945 were greater by about 25 per cent, new rail obtained was about the same in the two years, while locomotive deliveries declined by one-third.

Table VIII shows the number of units of equipment installed by railways of Class I during the first eleven months of 1945 and each of the five preceding calendar years. The table also shows the number of units on order as of the close of each period.

The equipment figures given in Table VII are for 12-month periods ended September 30, while the figures in Table VIII are on a calendar year basis. The reason for the use of different time periods in the two tables is that in the case of Table VII the period corresponds with equipment programs, which are generally timed to be completed by October 1 of each year; in the case of

Table VIII, the figures are shown for the customary accounting periods, or calendar years.

Table VIII—Equipment Installations

	Installed during year	On order at end of period
Steam locomotives:		
1945 (11 months)	92	104
1944	329	66
1943	429	339
1942	308	355
1941	161	258
1940	126	115
Electric and diesel locomotives:		
1945 (11 months)	510	380
1944	609	402
1943	344	616
1942	404	533
1941	472	288
1940	293	91
Freight-carrying cars:		
1945 (11 months)	36,418	35,908
1944	40,392	36,597
1943	28,708	35,737
1942	63,009	27,061
1941	80,502	74,897
1940	65,545	35,702

When figures for December become available, it is likely that installations of electric and Diesel locomotives and freight cars for the year 1945 as a whole will be close to those for the year 1944. Installations of new steam locomotives in 1945 will be far below those in prior war years.

Equipment ownership. As of October 1, 1945, locomotives in service numbered 42,707; railroad-owned freight cars totaled 1,769,365; passenger-carrying cars,

Equipment condition. During the early part of the war period, railroads reduced the ratios of locomotives and freight cars undergoing or awaiting repair to unprecedented low levels—4.9 per cent in the case of locomotives (classified repairs) and 2.4 per cent in the case of freight cars. Toward the end of the war period, continuing manpower and materials shortages caused these ratios to trend upward, and on October 1, 1945, they stood at 6.5 per cent for locomotives and 4.4 per cent for freight cars. Neither of these ratios is excessive when viewed by prewar standards.

Surplus Equipment

Stored Locomotives and Surplus Freight Cars. During the war period the reserves of stored serviceable locomotives and surplus freight cars were drained to the limit. Some improvement occurred in the locomotive situation during 1945, the number of stored locomotives being greater throughout the year than on corresponding dates in 1944. As of October 1, 1945, the number of stored serviceable locomotives was 1832, compared with 875 one year earlier. Due to the record grain movement and other factors, there was little

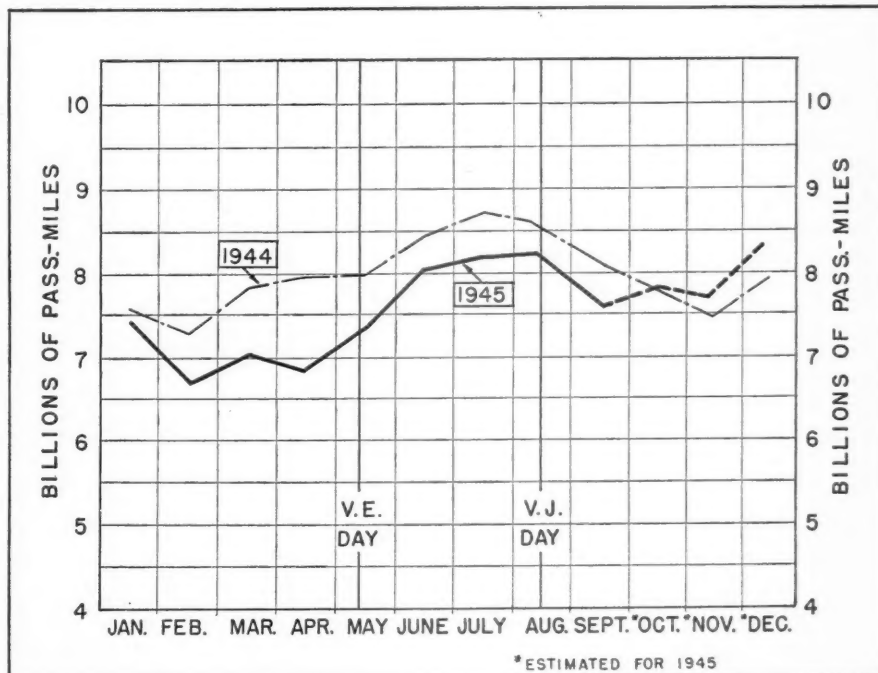


Chart B—Revenue Passenger Miles, by Months, for Class 1 Railways, 1944 and 1945

including Pullmans, amounted to 29,016. Compared with the same date one year earlier, these figures represent an increase of 123 locomotives, an increase of 11,468 freight cars, and a decrease of 210 passenger-carrying cars. Compared with the same date in 1940, five years earlier, the increases were 1,154 locomotives, 127,825 freight cars, and about 900 passenger-carrying cars.

or no improvement in the general freight car situation and tight conditions developed with respect to certain types of cars. During 1945, the maximum daily surplus was 23,416 cars and the minimum 5,770 cars. The range in 1944 was from a maximum of 28,998 surplus cars down to a minimum of 7,213 cars. Car shortages persisted throughout both years. The range in 1945 was from a

high of 19,397 to a low of 3,034 cars, compared with a high of 7,926 and a low of 257 in 1944.

Unit Prices. The prices paid by railroads for fuel, material and supplies in 1945 continued the upward trend which set in during the latter part of 1940. Based on May, 1933, as 100, the index of railway material and fuel prices compiled by the Bureau of Railway Economics stood at 174.2 in June, 1945. This was an increase of nearly 3 per cent compared with the index in June, 1944, and an increase of 33 per cent compared with June, 1940.

Excluding fuel, unit prices in June, 1945, showed an increase of 2 per cent over June, 1944, and an increase of 29 per cent over June, 1940. Fuel prices increased more than 4 per cent between June, 1944, and June, 1945, and increased 42 per cent over the five-year period.

The indexes are shown in Table IX, beginning with December, 1939. They are compiled in June and December of each year.

Table IX—Railway Material Prices (May, 1933=100)

	Material and supplies (other than fuel)	Fuel (coal and oil)	All Material
December, 1939	130.7	134.3	131.9
June, 1940	129.0	134.9	130.8
June, 1941	137.8	143.6	139.6
June, 1942	151.8	152.6	152.0
June, 1943	157.5	176.6	163.6
June, 1944	162.5	184.0	169.3
December, 1944	162.4	185.1	169.6
June, 1945	166.0	191.9	174.2

Capital Expenditures

Table X shows gross expenditures for additions and betterments to railroad properties, and purchases of fuel, material and supplies consumed in daily railroad operations and maintenance. The figures are for the ten years 1936 to 1945, inclusive.

Table X—Capital Expenditures and Purchases

Year	Gross capital expenditures (thousands)	Purchases of fuel, material and supplies (thousands)
1945 (est.)	\$500,000	\$1,625,000
1944	560,112	1,610,529
1943	454,282	1,394,281
1942	534,897	1,259,811
1941	543,021	1,161,274
1940	429,147	854,463
1939	262,029	769,314
1938	226,937	583,282
1937	509,793	966,383
1936	298,991	803,421
Total— 10 years	\$4,319,209	\$11,027,758

Capital expenditures in 1945 approximated \$500,000,000, a decrease of about 11 per cent compared with the previous year.

Expenditures for the ten-year period, 1936 through 1945, aggregated a little more than \$4,300,000,000. Of that amount, nearly one-half was spent in the four war years, 1942 through 1945.

Purchases of fuel, materials and supplies in 1945 approximated \$1,625,000,000, a small increase over 1944. Because of reduced traffic volume following V-J

Day, the consumption of fuel and certain other supplies was less than in 1944. However, increased prices and the building up of inventories which had fallen to low levels during the war more than offset such reduction.

Financial Results

Gross and net earnings from railroad operations declined in 1945. It was the third successive year of decreases in net earnings.

The following four tables give the significant income account items for the calendar years 1942, 1943, and 1944, and for the 12 months ended October 31, 1945. The first of these, Table XI, shows in condensed form the results of each year's operations.

Table XI—Condensed Income Account

	1945* (millions)	1944 (millions)	1943 (millions)	1942 (millions)
Total operating revenues	\$9,146	\$9,437	\$9,055	\$7,466
Total operating expenses	6,620	6,282	5,657	4,601
Operating ratio—per cent	72.4	66.6	62.5	61.6
Tax accruals	1,377	1,846	1,849	1,199
Net railway operating income	983	1,106	1,360	1,485
Net income	579	667	873	902

* 12 months ended October 31, 1945.

Operating revenues in the year ended October 31, 1945, were \$291,000,000, or 3 per cent, less than in the calendar year 1944. When final returns for the year 1945 as a whole become available, operating revenues will undoubtedly show a decrease below those of 1943. The decline in 1945 was due, of course, to reduced traffic volume.

operating revenues increased nearly one-fourth. Stated in whole figures, 1945 compared with 1942, operating revenues increased \$1,700 million; net railway operating income decreased \$500 million. Increased wage costs, material prices and tax accruals account for this wide spread.

After paying interest and other fixed

Table XII—Operating Revenues

	1945* (millions)	1944 (millions)	1943 (millions)	1942 (millions)
Freight	\$6,809	\$6,999	\$6,782	\$5,944
Passenger	1,696	1,790	1,653	1,028
Mail	132	130	125	112
Express	149	144	128	97
All other	378	374	367	285
Total	\$9,164	\$9,437	\$9,055	\$7,466

* 12 months ended October 31, 1945.

Operating expenses, on the other hand, showed a marked increase in 1945, being \$338,000,000, or 5.4 per cent, greater for the 12 months ended with October than for the year 1944. Part of this increase, possibly as much as \$200,000,000, was due to accelerated charges for amortization of defense projects in September and October, but even allowing for that fact, expenses increased in the face of declining revenues.

Due to the decrease in revenues and the increase in expenses, the operating ratio rose sharply in 1945. The ratio for the 12 months ended October 31, 1945, was 72.4 per cent, compared with 66.6 per cent in 1944 and 61.6 per cent in 1942. It was the highest ratio since 1939.

Tax accruals for the 1945 period amounted to \$1,377,000,000, a decline of \$469,000,000, or 25 per cent below 1944. The decrease reflects the narrowing margin between revenues and expenses. Nev-

charges in the 1945 period, net income amounted to \$579,000,000. This was a decline of \$88,000,000, or 13 per cent, below 1944, and a decline of \$323,000,000, or 36 per cent, below 1942.

It is anticipated that both the net railway operating income and the net income for the calendar year 1945, when the statistics become available, will show appreciable reductions below the results of the 12 months ended October 31.

Table XII shows the five principal operating revenue items for the four war years.

Freight revenue in the 12-month period ended October 31, 1945, declined \$190,000,000, or nearly 3 per cent below 1944. This may be compared with a decrease of 5 per cent in revenue ton-miles for the same period. The lower rate of decline in revenues than in ton-miles was reflected in a small increase in revenue per ton-mile. This was not due, however, to increased freight rates,

but rather to the greater proportion of higher-rated traffic handled.

Passenger revenue declined by \$94,000,000 in the 1945 period, a decrease of a little more than 5 per cent. Passenger-miles decreased at about the same percentage. Passenger revenue showed small declines in every month from November, 1944, through September, 1945, but increased slightly in October, 1945, and probably did the same in November and December.

Table XIII—Operating Expenses

	1945* (millions)	1944 (millions)	1943 (millions)	1942 (millions)
Maint. of W. & S.	\$1,327	\$1,263	\$1,108	\$796
Maint. of equip.	1,802	1,587	1,440	1,211
Traffic	143	137	129	118
Transportation	3,020	2,974	2,686	2,242
General and Other	328	321	294	234
Total	\$6,620	\$6,282	\$5,657	\$4,601

* 12 months ended October 31, 1945.

Mail, express and all other revenues each showed small increases in the 1945 period over the year 1944. However, these increases may have been wiped out by the end of the calendar year. Railway express revenue is, of course, to be distinguished from the gross revenue of the Railway Express Agency, which for the first nine months of 1945 reported a gross of \$331 million.

Table XIII shows the principal operating expense items for the four war years. Each of the five principal accounts showed an increase in the 1945 period, and each was at record levels for that period.

Expenditures for maintenance of way and structures during the 12 months ended October 31, 1945, increased over the year 1944 by \$64,000,000, or 5 per cent; maintenance of equipment showed an increase of \$215,000,000, or 13.5 per cent. Both of these accounts were influenced by accelerated charges for amortization of defense projects in September and October, but both would have shown increases without such accelerated charges.

Traffic expenses increased \$6,000,000, or 4 per cent; transportation expenses, which represent nearly half of total operating expenses, increased \$46,000,000, or 1.5 per cent; general and other expenses increased \$7,000,000, or 2 per cent.

The final table in this series shows the rate of return on property investment for the 12 months ended October 31, 1945, and for certain earlier years. The return for the 1945 period was 3½ per cent, compared with 4 per cent in 1944 and 5½ per cent in 1942. When final returns for the calendar year 1945 become available, the rate of return for that year will be less than 3½ per cent.

Operating Efficiency

The next five tables show trends in significant performance averages of rail-

road operations during the war period. Comparable averages for the year 1929 and 1920 are also shown, in order to picture the trends over a longer period.

While no single performance average combines all of the efficiency and economy factors in freight service, the one that comes closest to doing so is average ton-miles per freight train hour. This is a highly significant average, as it combines the various load and speed factors and shows the unit output of the

average hour of freight train operation. The average is computed on two bases: (1) gross ton-miles of cars and contents per freight train-hour, and (2) net ton-miles (loading only) per freight train-hour. The figures are given in Table XV.

Table XIV—Rate of Return on Property Investment

Year	Net railway operating income (millions)	Rate of return (per cent)
1929.....	\$1,252	4.81
1937.....	590	2.27
1939.....	589	2.25
1940.....	682	2.59
1941.....	998	3.75
1942.....	1,485	5.50
1943.....	1,360	4.92
1944.....	1,106	3.97
1945*.....	983	3.52

* 12 months ended October 31, 1945. Rate of return computed on property investment as of January 1, 1945.

Table XV—Ton-Miles Per Freight Train-Hour

Year	Gross Ton-miles	Net Ton-miles
1920.....	14,877	7,303
1929.....	24,539	10,580
1939.....	32,808	13,450
1940.....	33,811	14,028
1941.....	34,684	14,930
1942.....	35,503	16,132
1943.....	35,970	16,997
1944.....	37,294	17,621
10 months:		
1944.....	37,552	17,745
1945.....	37,337	17,674

The marked improvement in these averages during the past quarter century is manifest. Compared with 1920, gross ton-miles per freight train-hour in 1944 increased 151 per cent; net ton-miles per freight train-hour increased 141 per cent. Due to reduced traffic volume in 1945, the averages showed a slight decline for the first 10 months of the year below the averages for the same months of 1944. These small reductions will probably also be reflected in the averages for the year as a whole when final figures become available. In both cases, the reduction in 1945 was less than one per cent.

Another very significant set of operating averages is that showing daily

mileage of locomotives and freight cars. Performances in this respect also broke all previous records during the war period. The trends are shown in Table XVI for freight locomotives, for passenger locomotives, and for freight cars.

Table XVI—Daily Mileage of Locomotives and Cars

Year	Freight locomotives	Passenger locomotives	Freight cars
1920.....	89.1	158.5	27.0
1929.....	91.2	164.5	34.4
1939.....	104.0	184.2	36.4
1940.....	107.5	190.8	38.9
1941.....	116.4	195.6	43.7
1942.....	122.4	206.8	48.8
1943.....	124.5	220.9	51.0
1944.....	122.8	222.9	51.9
10 months:			
1944.....	123.5	222.2	52.3
1945.....	119.8	224.5	50.5

Compared with 1920, freight locomotives in 1944 averaged 33.7 more miles per day, an increase of 38 per cent; passenger locomotives averaged 64.4 more miles per day, an increase of 41 per cent; freight cars averaged 24.9 more miles per day, an increase of 92 per cent. During the first ten months of 1945, the average daily mileage of passenger locomotives showed a further increase of 2.3 miles per day, or one per cent, but freight locomotives showed a decline of 3.7 miles per day and freight cars a decline of 1.8 miles per day, decreases of 3 per cent and 3.4 per cent, respectively, below the corresponding period of 1944.

Because of the great increase in number of trains on the rails during the war period, the average speed of trains between terminals declined somewhat. The averages for freight and passenger trains appear in Table XVII.

Table XVII—Average Train Speed (MPH)

Year	Freight trains	Passenger trains
1920.....	10.3	...
1929.....	13.2	...
1939.....	16.7	36.9
1940.....	16.7	37.3
1941.....	16.5	37.6
1942.....	15.8	36.9
1943.....	15.4	35.7
1944.....	15.7	35.8
10 months:		
1944.....	15.7	35.9
1945.....	15.7	35.8

The low point in average train speeds during the war period was in 1943, when the average for freight trains showed a decline of about 8 per cent below the prewar record high, and passenger train speed decreased about 5 per cent. Some slight improvement took place in 1944 and was maintained during the first 10 months of 1945.

The heavy traffic volume seeking rail movement during the war period necessitated maximum loads per car and per train, both in freight and passenger services. As previously indicated, it was not possible to obtain as many new freight cars as were needed to handle the traffic under prewar loading standards, and no new passenger-train car construction was permitted. The ODT issued minimum load orders in freight service, particularly Order Nos. 1 and

18, and the wholehearted cooperation of shippers and the various government agencies in holding to or exceeding those minima largely made possible the record movement of freight. The public also accepted with good-natured understanding the crowded conditions encountered on many passenger trains.

Table XVIII shows average loads per car and per train in freight and passenger services.

Table XVIII—Train and Car Loads

Year	Freight Service		Passenger Service	
	Net tons per train	Net tons per car	Passengers per train	Passengers per car
1920.....	708	29.3	82.5	20.6
1929.....	804	26.9	55.0	11.7
1939.....	813	26.9	58.0	13.4
1940.....	849	27.6	60.7	13.8
1941.....	915	28.5	73.2	15.8
1942.....	1,035	31.8	125.5	23.1
1943.....	1,116	33.3	189.5	31.7
1944.....	1,138	32.7	199.8	32.2
10 months:				
1944.....	1,144	32.8	*203.1	*32.6
1945.....	1,140	32.3	*188.9	*30.5

* 9 months.

Between 1920 and 1944, net tons per train increased 61 per cent; net tons per car increased 12 per cent; passengers per train increased 142 per cent; passengers per car increased 56 per cent. The greater part of these increases occurred during the war period, although considerable progress had been made in heavier loading in freight service up to the outbreak of the war. The tremendous upsurge in passenger traffic beginning in 1942 is clearly apparent from the passenger load averages during the war period. A passenger train occupancy of some 200 passengers, as in 1944, is the average for all trains; many popular main-line expresses averaged 500 passengers or more.

Efficiency in fuel utilization declined slightly during the war period, due in part to inferior grades of coal, in part to reduced average train speeds, and in part to maximum use of older types of locomotives. Average fuel performances in freight and passenger services appear in Table XIX.

Table XIX—Locomotive Fuel Performance

Year	Gross ton-miles per ton of fuel (freight service)	Passenger train car-miles per ton of fuel (passenger service)
1920.....	*12,367	106
1929.....	16,007	134
1939.....	17,774	135
1940.....	17,839	133
1941.....	18,085	133
1942.....	18,069	133
1943.....	17,574	133
1944.....	17,455	135
10 months:		
1944.....	17,720	137
1945.....	17,516	136

* Year 1921.

Railroad Safety

Fewer passengers and fewer employees were fatally injured in railroad accidents during the first 10 months of 1945 than in the same period of either

1944 or 1943. The fatality rate per hundred million passenger-miles to passengers on trains for the first 10 months of each of the last three years was as follows: 1943, 0.24; 1944, 0.20; 1945, 0.15. The fatality rate per million man-hours worked to employees on duty declined from 0.26 in the first 10 months of 1943 to 0.24 in the same period of 1944 and further to 0.22 for the same months of 1945. Nonfatal injury rates, on the

other hand, showed slight increases in 1945 over 1944.

The lifting of gasoline rationing shortly after V-J Day resulted in increased highway travel, with increased hazards at highway grade crossings. In the first 10 months of 1945, a total of 1,477 persons were killed and 3,320 injured in highway grade crossing accidents. These figures compare with 1,388 killed and 3,143 injured in the same months of 1944.

Similarly, casualties to trespassers on railroad property increased in 1945. For the first 10 months there were 1,376 fatalities and 1,037 injuries, compared with 1,288 fatalities and 987 injuries in the same period of 1944.

Summary and Conclusion

The war is over. A new era is under way, fraught with many uncertainties, both international and internal. One fact is, however, certain. What the railroads may anticipate in the first few years of the postwar period, in the way of traffic and earnings, will depend largely on the trend of production and of employment in the United States.

As to production, a short period of recession is to be expected, as the task of reconversion is carried out, and as the nation effects a gradual transition from war to peacetime requirements. This period, unless prolonged by unnecessary strife over wages and prices, should terminate not later than the end of 1946. The recession that followed the first World War was a sharp one, but it was of relatively short duration, principally because economic forces were permitted to govern the shift from the inflationary levels of 1919 and 1920 to the more nearly normal levels of the next ten years.

The current postwar problem is less serious because inflation has not risen to the extremes of the last war. Yet inflationary elements are at work today, stimulated by efforts in certain high quarters to interfere with economic processes, and a disposition to ignore the definite relationship between high—and higher—wages and the general price level. The length of the readjustment period will, therefore, depend in large measure on the wisdom brought to bear on the whole inflationary problem in the first few months of the year 1946.

Employment is closely related to production. Assuming that the readjustment of manpower, from the armed forces to civilian employment, and from war plant employment to peacetime production, is completed without serious difficulty, that transition, too, should be completed or approach completion during the coming year.

Following the readjustment period, whatever its length, deferred demands for American goods in both domestic and foreign markets should maintain production at high levels for several years ahead, perhaps up to the year 1950. These levels should be above those of any prewar year, although in the case of most industries below wartime peaks. The railroads will benefit from such stimulated production, to the extent that they can meet renewed and intensified postwar competition from other agencies of transport.

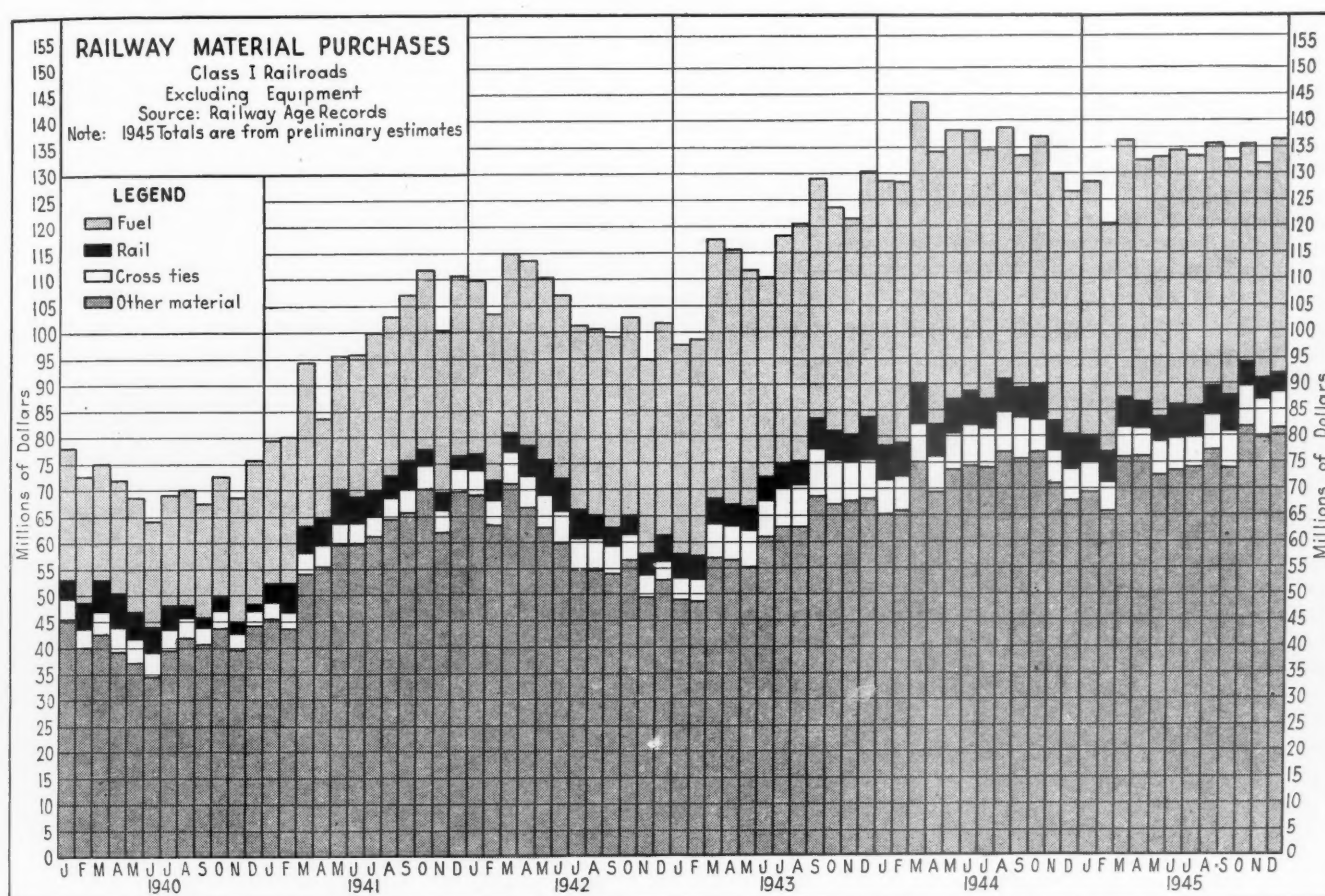
Even with traffic volumes geared to high productive activity in the next four or five years, the railroads will have their financial problems. Wage rates and material prices are considerably above 1939 and 1940 levels, and traffic volumes equivalent to the greatest of the prewar years would not be sufficient to supply adequate net earnings, unless the price of railroad transportation service is also increased. How this problem is to be met remains yet to be solved; every effort will be made to obtain the largest possible amount of freight and passenger traffic which would offer the most satisfactory solution.

The longer postwar period, from 1950 on, presents even greater uncertainties, and little can be done to indicate the possibilities of production and employment in that period. The corresponding postwar period of the first World War was one of prosperity which lasted for some eight years.

Closing the books on a sterling contribution to the war effort, in which they met all the many unusual and unprecedented demands made upon them, railroads of the United States look forward at the beginning of 1946 to rendering a continued high level of transportation service to the American people in the post-war period.

Post-War Buying Off to Good Start

Equipment orders of \$320,100,000 plus heavy purchases of materials and supplies in last quarter swell the 1945 total to \$1,911,235,000



By C. MILES BURPEE

Purchasing & Stores Department Editor

PURCHASES of equipment, materials, supplies and fuel by Class I railways in 1945 amounted to \$1,911,235,000, 10 per cent more than for 1929 and greater than for any year since, approximately 2 per cent more than in 1944, about 16 per cent more than in 1943, 20 per cent greater than in 1942 and 21 per cent more than in 1941, according to preliminary estimates prepared by *Railway Age* and based upon special reports from a large proportion of the carriers. The 1945 total includes \$1,040,909,000 of materials received from manufacturers, \$320,100,000 of locomotives and cars ordered during the year from manufacturers and \$550,226,000 for fuel deliveries.

Of the \$320,100,000 of new cars and locomotives ordered by the railways during 1945 approximately \$115,000,000 was for 36,678 new freight train cars, \$107,900,000 was for 1,269 new pas-

senger train cars and \$97,300,000 was for 606 new Diesel-electric locomotives, 148 steam locomotives and 6 electric locomotives. Big news of the year in equipment circles came in mid-December when the New York Central placed its record-breaking \$34,000,000 order for 22 sleeping car trains comprising 420 cars which in addition to daylight passenger train equipment already under construction brought the Water Level Route's 1945 orders for new passenger train equipment up to \$56,000,000, which represents the equivalent of 52 new streamliners.

Record in Manufactured Goods

Despite sharp dips in the delivery of steel rails and crossties, despite pronounced slowing up of deliveries because of strikes and wage disputes, Class I roads bought and received more than a

Table I
Comparative Purchases of Equipment, Materials and Fuel by All Class I Railways for 1945 and 1941

	1945* (000)	1941 (000)	Change Per Cent
Equipment**	\$320,100	\$414,690	-23
Rails	62,608	52,234	+20
Crossties	77,490	49,494	+57
All Other Material	900,811	709,781	+27
Total from Manufacturers	\$1,361,009	\$1,226,199	+11
Fuel	550,226	349,765	+57
Grand Total	\$1,911,235	\$1,575,964	+21

* Preliminary estimates by *Railway Age* of materials and supplies received.

** Amount of equipment placed on order. Total railway purchases of all durable goods from manufacturers and charged to both capital and operation were larger in both years than the figures given in the table.

Table II
Annual Purchases of Materials, Supplies and Equipment—Class I Railroads

	Fuel (000)	Rail (000)	Cross Ties (000)	Other Material (000)	Total (000)	Total Less Fuel (000)	Equip- ment x (000)	Grand Total Equip., Mtls. & Fuel (000)
1929	\$336,805	\$88,735	\$143,874	\$759,186	\$1,328,600	\$991,795	\$397,121	\$1,725,721
1930	308,277	60,980	127,652	538,591	1,035,500	727,223	146,471	1,181,971
1931	244,500	41,500	44,000	365,000	695,000	450,500	28,873	723,873
1932	178,250	15,500	27,550	223,700	445,000	266,750	2,623	447,623
1933	179,150	10,650	19,750	248,200	457,750	278,600	5,857	463,607
1934	220,000	33,200	39,700	332,100	625,000	405,000	66,850	691,850
1935	232,400	20,354	33,780	306,593	593,127	360,727	35,696	628,823
1936	271,398	37,237	41,360	452,309	802,304	530,906	240,594	1,042,898
1937	293,540	44,935	58,361	562,100	958,936	665,396	194,153	1,153,089
1938	243,889	23,920	37,911	277,091	582,811	338,922	74,006	656,817
1939	257,880	38,340	39,760	434,394	770,374	512,494	188,838	959,212
1940	273,556	45,065	47,855	487,987	854,463	580,907	264,943	1,119,406
1941	349,765	52,234	49,494	709,781	1,161,274	811,509	414,690	1,575,964
1942	426,335	55,647	63,153	714,676	1,259,811	833,476	325,000†	1,584,811
1943	527,296	60,074	83,402	723,509	1,394,281	866,985	248,000†	1,642,281
1944	585,832	75,763	85,202	863,732	1,610,529	1,024,697	255,000	1,865,529
1945*	550,226	62,608	77,490	900,811	1,591,135	1,040,909	320,100	1,911,235

* Preliminary Estimates.
 x Estimated value of orders for new locomotives and cars.
 † Estimated value of orders, for new locomotives and cars built by equipment builders and placed in service during 1942 and 1943.

billion dollars worth of materials and supplies from manufacturers in 1945. Despite slow deliveries, one of the most significant aspects is the continuation of heavy purchases throughout the entire period between V-E day and the end of the year, especially since the end of the war in the Pacific theater. Last year's deliveries of \$1,040,909,000 topped those of 1944 by about 1½ per cent and with the single exception of 1926 were greater than for any year since 1923. They exceeded similar deliveries in 1943 by 20 per cent, those of 1942 by 25 per cent, were fully 28 per cent more than for 1941 and approximately 8 per cent greater than in 1929.

A new record was established in 1945 when expenditures for the thousands of

Table III
Monthly Purchases of Materials and Supplies 1940-1945—Class I Railroads

Miscellaneous Materials and Supplies—In Thousands						Rail—In Thousands					
1945*	1944	1943	1942	1941	1940	1945*	1944	1943	1942	1941	1940
Jan.	\$69,209	\$64,987	\$49,000	\$68,988	\$45,387	\$45,506	\$5,072	\$6,423	\$4,811	\$3,071	\$3,459
Feb.	65,715	65,693	48,407	63,148	43,400	39,870	5,273	6,264	4,340	3,813	5,289
Mar.	75,634	75,033	56,911	71,103	53,988	42,589	5,776	7,700	4,718	3,766	5,160
Apr.	75,715	69,337	56,412	66,409	55,377	39,354	4,971	6,175	4,181	5,827	4,850
May	72,539	73,446	55,170	62,812	59,412	37,064	4,585	6,188	4,599	6,637	6,186
June	73,601	74,351	60,923	59,822	59,597	34,458	5,861	6,508	4,584	5,829	4,861
July	73,992	73,899	62,733	54,873	61,026	39,381	6,182	5,597	4,332	5,569	4,690
Aug.	77,691	76,941	62,714	54,856	64,278	41,932	5,286	6,358	4,396	4,620	3,873
Sept.	73,815	75,783	68,564	54,087	65,618	40,692	6,802	5,647	5,613	3,620	5,503
Oct.	81,700	75,945	67,077	56,689	70,141	43,541	4,900	6,834	5,721	3,765	2,960
Nov.	79,700	70,697	67,532	49,391	61,960	39,534	4,100	5,338	5,346	4,259	3,184
Dec.	81,500	67,620	68,066	52,498	69,597	44,066	3,800	6,731	7,433	4,871	2,219
	\$900,811	\$863,732	\$723,509	\$714,676	\$709,781	\$487,987	\$62,608	\$75,763	\$60,074	\$55,647	\$52,234
											\$45,065
Cross-ties—In Thousands						Total Material (Less Fuel)—In Thousands					
Jan.	\$5,722	\$6,895	\$4,037	\$4,871	\$3,434	\$4,116	\$80,003	\$78,305	\$57,848	\$76,930	\$52,280
Feb.	5,576	6,675	4,530	4,814	3,475	3,916	76,564	78,632	57,277	71,775	52,164
Mar.	5,659	7,370	6,481	6,100	4,042	4,625	87,069	90,103	68,110	80,969	63,190
Apr.	5,769	6,745	6,625	6,143	4,317	4,571	86,455	82,257	67,218	78,379	64,544
May	6,623	7,410	6,758	6,156	4,321	4,774	83,747	87,044	66,527	75,605	69,919
June	6,270	7,589	6,826	6,138	4,025	4,631	85,732	88,448	72,333	71,789	68,483
July	5,902	7,475	7,550	5,682	4,146	4,280	86,077	86,971	74,615	66,124	69,862
Aug.	6,736	7,532	8,156	5,609	4,297	3,886	89,713	90,831	75,266	65,085	72,448
Sept.	7,233	7,866	9,032	5,127	4,347	3,372	87,849	89,296	83,209	62,834	75,468
Oct.	8,100	7,101	8,301	4,624	4,350	3,477	94,700	89,880	81,099	65,078	77,451
Nov.	7,200	6,618	7,395	4,073	4,074	3,107	91,000	82,653	80,273	57,723	69,218
Dec.	6,700	5,926	7,711	3,816	4,666	3,100	92,000	80,277	83,210	61,185	76,482
	\$77,490	\$85,202	\$83,402	\$63,153	\$49,494	\$47,855	\$1,040,909	\$1,024,697	\$866,985	\$833,476	\$811,509
											\$580,907
Fuel—In Thousands						Total Materials & Fuel—In Thousands					
Jan.	\$48,452	\$50,341	\$39,883	\$32,851	\$27,254	\$24,965	\$128,455	\$128,646	\$97,731	\$109,781	\$79,534
Feb.	43,916	50,041	41,542	31,991	27,894	24,208	120,480	128,673	98,819	103,766	80,058
Mar.	49,173	53,277	49,297	34,025	31,113	21,870	136,242	143,380	117,407	114,994	94,303
Apr.	46,198	51,655	48,369	35,230	19,198	21,565	132,653	133,912	115,587	113,609	83,742
May	49,274	51,039	44,991	34,701	25,544	21,842	133,021	138,083	111,518	110,306	95,463
June	48,847	49,706	38,019	35,290	27,331	20,151	134,578	138,154	110,352	107,079	95,814
July	47,665	47,384	43,695	35,152	29,693	20,868	133,742	134,355	118,310	101,276	99,555
Aug.	45,996	47,954	45,403	35,468	30,527	22,118	135,710	138,785	120,669	100,553	102,975
Sept.	44,905	43,977	45,702	36,318	31,597	21,565	132,754	133,273	128,911	99,152	107,065
Oct.	40,800	46,974	42,405	37,784	34,335	23,094	135,500	136,854	123,504	102,862	111,786
Nov.	41,000	47,057	40,991	37,126	31,054	24,135	132,000	129,710	121,264	94,849	100,272
Dec.	44,000	46,427	46,999	40,399	34,225	27,175	136,000	126,704	130,209	101,584	110,707
	\$550,226	\$585,832	\$527,296	\$426,335	\$349,765	\$273,556	\$1,591,135	\$1,610,529	\$1,394,281	\$1,259,811	\$1,161,274
											\$854,463

* Subject to revision.

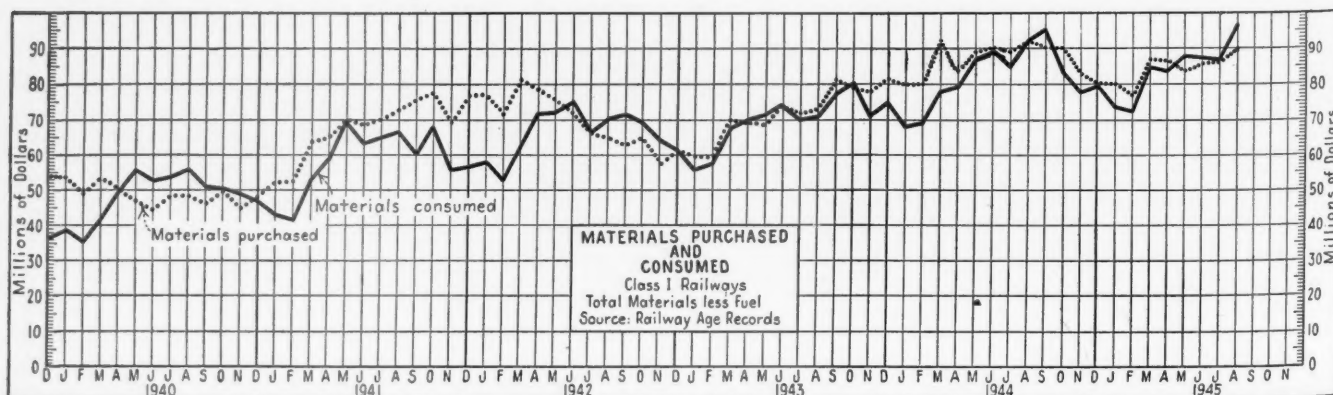


Table IV
Fuel, Materials and Supplies in Stock—Class I Railroads

	Fuel (000)	Rail—New and S. H. (000)	Cross Ties (000)	Stores Stock (000)	Scrap (000)	Total (000)
Year 1943						
Jan. 1	\$47,612	\$18,131	\$52,977	\$375,376	\$9,805	\$503,901
Feb. 1	43,654	19,583	56,587	374,097	10,408	504,329
Mar. 1	45,374	20,651	58,999	371,835	10,385	507,244
Apr. 1	50,330	20,753	62,280	371,332	10,517	515,212
May 1	55,627	19,206	61,016	373,565	10,105	519,519
June 1	58,172	19,424	60,479	370,995	10,167	519,237
July 1	55,595	20,811	56,863	373,205	10,267	516,741
Aug. 1	58,216	19,035	57,536	376,295	9,258	520,340
Sept. 1	61,204	19,558	59,185	376,180	8,607	524,734
Oct. 1	61,925	19,764	61,665	378,022	8,170	529,546
Nov. 1	58,769	19,067	62,809	376,825	11,392	528,862
Dec. 1	52,007	21,631	64,368	379,962	8,284	526,252
Year 1944						
Jan. 1	50,221	22,342	67,964	382,566	9,628	532,721
Feb. 1	49,056	24,331	72,039	387,899	9,937	543,262
Mar. 1	49,749	25,199	76,254	393,892	9,925	555,019
Apr. 1	49,938	26,923	81,525	400,722	10,334	569,442
May 1	51,320	23,081	80,463	410,114	10,319	575,297
June 1	56,885	22,637	79,004	413,410	10,346	582,282
July 1	62,558	22,729	75,244	418,408	9,683	588,622
Aug. 1	64,515	23,190	75,004	422,002	9,682	594,393
Sept. 1	67,538	22,324	71,306	427,277	10,292	598,737
Oct. 1	67,357	22,253	70,322	430,811	11,488	602,231
Nov. 1	66,997	24,392	70,052	435,141	9,216	605,798
Dec. 1	64,723	23,557	69,875	440,470	9,592	608,237
Year 1945*						
Jan. 1	59,182	24,292	72,434	437,575	10,155	603,638
Feb. 1	56,398	25,149	75,259	440,353	10,021	607,180
Mar. 1	52,237	26,760	78,090	439,922	14,093	611,102
Apr. 1	52,313	27,142	78,236	441,106	15,345	614,142
May 1	51,236	26,057	74,792	448,326	10,414	610,825
June 1	51,402	24,238	70,302	450,437	10,110	606,489
July 1	53,708	25,213	67,450	450,773	9,494	606,638
Aug. 1	56,248	26,332	66,422	449,821	9,280	608,103
Sept. 1	55,333	25,611	62,070	448,110	13,979	605,103

* Subject to revision.

items comprising storehouse stocks and used for maintenance and operation (excluding rail, crossties and fuel) amounted to \$900,811,000, an increase of 5 per cent compared to the preceding year, 25 per cent more than for 1943, about 27 per cent greater than for 1942, approximately 28 per cent more than for 1941 and about 19 per cent greater than in 1929.

Rail deliveries dropped off approximately 17 per cent compared with 1944 and amounted to about \$62,608,000; this is four per cent more than for 1943, about 12 per cent greater than for 1942 and 20 per cent more than for 1941.

Total crosstie receipts approximated \$77,490,000 or nine per cent less than for the previous year, seven per cent below 1943, but 23 per cent greater than in 1942 and 55 per cent more than for 1941. Despite an increase in the prices during the latter part of July, which was followed by a general upswing in production in August and September, subsequent reports from many tie production territories indicate that these gains were not held. The situation has been spotty, with several areas maintaining substantial gains well up into December. In other districts, because of early fall and winter rains, absenteeism, scarcity of labor, trucks and repair parts for equipment, as well as pronounced disinclination on the part of discharged service men to return to the woods and the mills, the outlook for 1946 production is not bright.

Purchases of coal and petroleum fuel products receded from 1944's peak and

approximated \$550,226,000 last year. However, with that single exception, 1945 fuel purchases were greater than for any year since 1923. They exceeded those of 1943 by four per cent, those of 1942 by 29 per cent and were 57 per cent greater than for 1941.

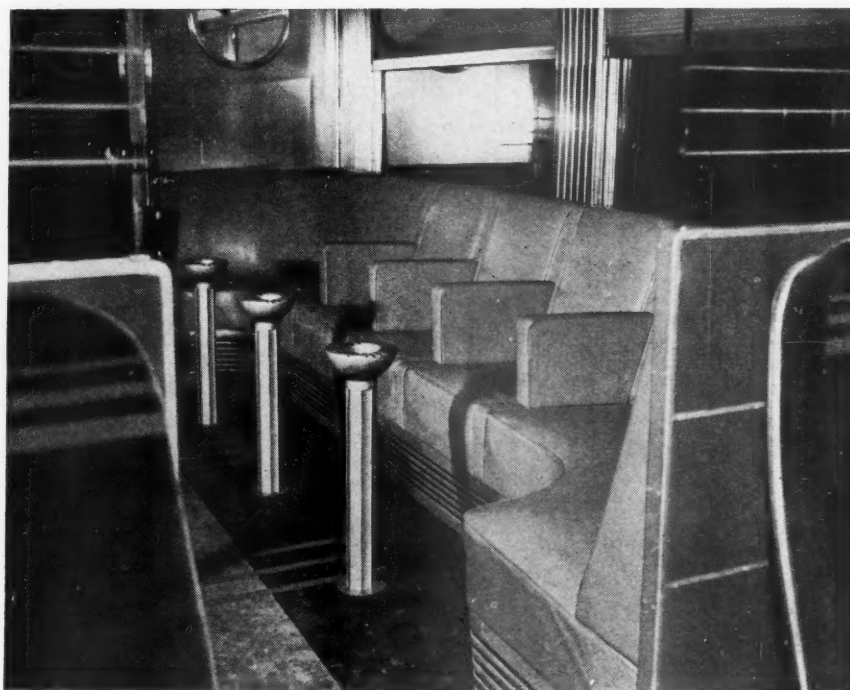
Although a relatively favorable but small balance was maintained between

monthly purchases and use of manufactured materials, comprising stores stock, crossties and rails but excluding fuel, from October, 1944, through the first part of 1945, the consumption curve crossed the purchase curve in April and the volume of monthly consumption has exceeded that of monthly purchases ever since. By the end of August, as indicated in an accompanying chart, material consumption swung upward sharply.

The value of all materials including fuel and scrap stocked by Class I railways amounted to \$605,103,000 on September 1 (latest available as this is being written), according to a report of the Interstate Commerce Commission, and an increase of approximately one per cent compared with figures for the same day a year ago. Contrary to last year, however, inventory values built up to a peak of \$614,142,000 on April 1, 1945, and then fell off.

According to *Railway Age* estimates the value of all manufactured materials and supplies (excluding fuel and scrap) carried in stock by the railways built up progressively from October 1, 1944, until it reached a peak of \$549,175,000 on May 1, 1945. From then until September 1, 1945 (latest figures available at this writing), consumption out-stripped deliveries and inventories sagged to \$535,791,000: Inventory figures for fuel reflect a serious handicap compared with the preceding year, for although inventories on May 1, 1945, approximated those of May 1, 1944, the customary build-up did not occur, with the result that on September 1, 1945, stock values were off 18 per cent.

* * *



Luxurious lounge facilities have become an established part of the appeal of the passenger coach

Finances on Mend, But Not Yet Robust

Bonds top pre-depression highs but stocks reach only 1937 level and remain far below average of industrials

By J. G. LYNE

Assistant to Editor

WHILE railway traffic and net operating income experienced the sharp drop which was to have been expected with the war's end, the fundamental financial situation of the railways continued to improve through 1945; but the persistent depression of railroad stock prices, both below par and far below the average of industrial stocks, continues to demonstrate that the carriers have not yet been restored to the position of healthy private enterprise. In a "bull" market so strong that many observers are becoming worried about it, railroad shares succeeded in climbing up only to 64 on the Dow-Jones average, as compared to an average of 195 for industrial shares. The 1945 "high" for railroad shares is almost exactly equal to the "high" attained in 1937 when net railway operating income was running at about half its current total.

No Equity Financing Planned

A questionnaire sent to the railroads by the Bureau of Transport Economics and Statistics of the I. C. C. in April, to learn their plans for post-war capital expenditures, disclosed the fact that not one of the Class I railroads planned to finance such expenditures by equity issues. In fact, the roads revealed that they expected to finance only 30 per

Statistical tables were compiled by Edith C. Stone, *Railway Age's* librarian, and by Marion Odomirok and Thomas D. Lyne.

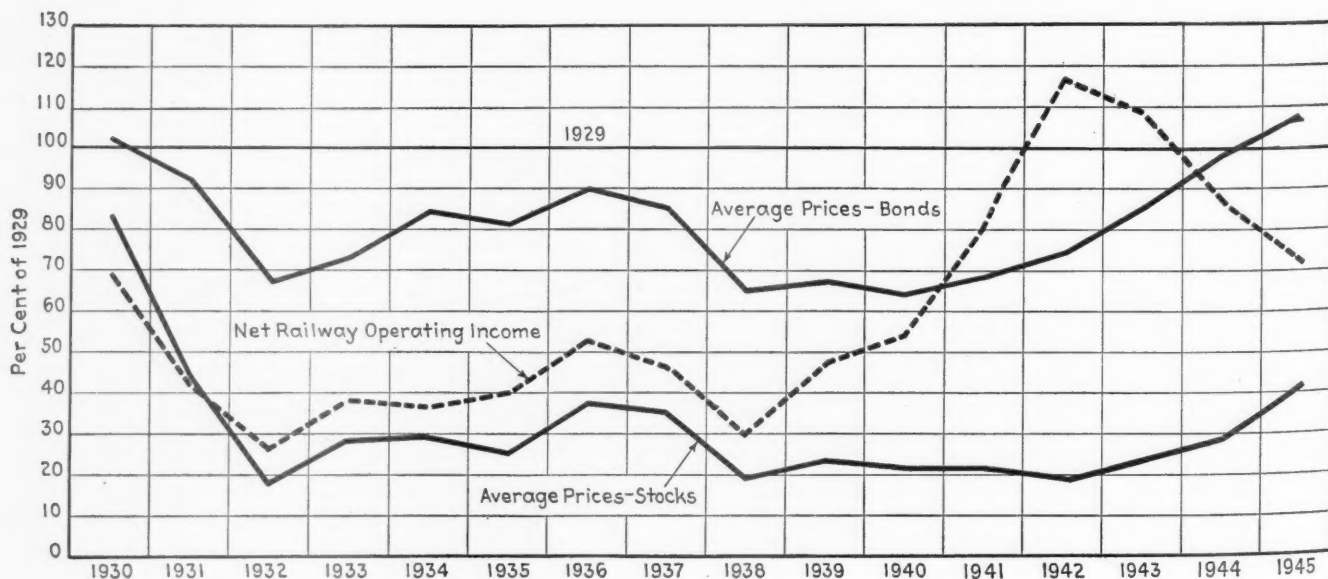
Refunding operations, to reduce interest costs and to anticipate maturities, continued during the year—but flotations for new financing, except of equipment, continued their conspicuous absence. Thus the industry has grown in financial strength, but without yet having tested its ability to attract a new inflow of investment funds.

cent of their post-war capital outlays by the issue of securities of any kind; they are going to rely on earnings for financing 70 per cent of the cost of these betterments. This information may be welcome to those who approve extreme conservatism in the financial management of the railroads—but it affords no evidence that the industry's health has been restored. When a patient is truly recovered, he takes his nourishment through the mouth, and no longer has to have it injected intravenously.

One small company, operating less than 100 miles of line, was placed in trusteeship during the year, and five

companies with almost 11,000 miles of line were removed from the jurisdiction of the courts. The Interstate Commerce Commission remained as adamant as ever in its insistence that equity-holders be frozen out in the reorganization of bankrupt railroads, despite the large earnings of such stocks. There are property values behind these equities, which nobody denies, and there are earnings values behind them, too—at least in years of heavy traffic—but the commission insists that these stocks are without value and should be torn up. A legal way has been found, that is, of taking these equity-holders' property and transferring it, either to the public in rates which do not cover a fair return on the investment in property devoted to the public service, or to the holders of junior indebtedness of the old companies who become the stockholders of the reorganized companies. It is small wonder that the commission's questionnaire to the railroads does not reveal that a single one of them is planning to do any future financing by the issuance of equities. As the accompanying chart shows, railroad bonds have been currently selling at substantially higher prices than they brought in 1929, while stocks are almost 60 per cent below the 1929 price.

It cannot be said, of course, that the continued depression in the prices of railroad equities, in comparison with those of industry, is ascribable entirely to the Commission's treatment of these



Railway Age average prices of 20 representative stocks and 20 bonds

Market price fluctuations do not parallel those in earnings

issues in reorganizations. The other depressing factor—continued governmental favoritism to highway, waterway and air transportation by billions in uncompensated gifts from the public treasury—continues unabated, and is even being augmented. There are those who had believed that the size of the federal debt would have inclined Congress to less lavishness than heretofore in its donations of tax funds for the construction of facilities to rival the self-supporting railroads, but recent events have not confirmed this opinion. There were even those who had hoped that business men, heretofore ardent advocates of transportation appropriations for their own selfish benefit, might grow alarmed at war-time federal inroads into the economy; and that they might decide to forego further demands upon the Treasury, as a means of putting the socialistic appetite of some branches of the government on a starvation diet.

These hopes faded away recently, however, when the National Highway Users Conference, which is headed by a prominent manufacturer and spokesman for

New Issues of Railroad Securities Offered for Sale in the United States†
1934-1945

(Amounts in thousands of dollars)					
Year	Bonds	Stock	Railroad total	Total all industries	Railroad as per cent of total
1934	\$176,423	....	\$176,423	\$397,240	44.4
1935	126,031	....	126,031	2,331,630	5.4
1936	793,618	\$3,838	797,456	4,571,670	17.4
1937	344,257	....	344,257	2,309,524	14.9
1938	54,873	....	54,873	2,154,664	2.5
1939	185,474	233	185,707	2,164,007	8.6
1940	323,912	....	323,912	2,677,173	12.1
1941	366,313	....	366,313	2,666,887	13.7
1942	47,726	....	47,726	1,062,288	4.5
1943	161,179	....	161,179	1,169,692	13.8
1944	609,010	350	609,360	3,201,891	19.0
1945*	1,384,955	....	1,384,955	5,210,073	26.6

* 10 months total.

† Compiled by Securities and Exchange Commission.

"free enterprise," came out strongly for continued heavy "federal aid" highway appropriations, which, the Conference insists, must be paid out of general taxation and not by levies on the users of the highways. Hopes that socialization might have become sufficiently distasteful to business men to lead them to oppose it even when it promised them immediate selfish gain took another knock-out blow from the National Industrial Traffic League when it refused

at its annual meeting to approve a recommendation by its special committee on transportation policy that tolls be laid on the use of improved inland waterways.

Attitude of Business

It has been charged by critics that most American business men make no distinction between the principles of private enterprise and simple acquisi-

Representative Equipment Trust Issues Sold in 1945

Road	Maturity	Amount	Int. Rate %	Sold to Banker		Purchaser
				Price	Cost	
Baltimore & Ohio	1946-1960	\$3,450,000	2	99.28	2.10	Salomon Bros. & Hutzler, et al.
Baltimore & Ohio	1946-1960	4,680,000	2	100.073	1.99	Salomon Bros. & Hutzler, et al.
Baltimore & Ohio	1946-1960	4,575,000	2½	100.132	2.11	Salomon Bros. & Hutzler, et al.
Chesapeake & Ohio	1946-1955	1,500,000	1½	100.03	1.49	Girard Trust Co. & Central Penn Nat'l Bank.
Chesapeake & Ohio	1946-1955	2,500,000	1½	100.209	1.58	Salomon Bros. & Hutzler, et al.
Chicago & Eastern Illinois	1946-1960	1,440,000	2	99.53	2.06	Halsey, Stuart & Co.
Chicago & North Western	1946-1955	6,180,000	1¾	100.331	1.68	First National Bank of Chicago, et al.
Chi., St. P., Minn. & Omaha	1946-1955	1,570,000	1¾	100.273	1.70	Northw'n Trust Co. & Northw'n Natl. Bank of Minn.
Chi., Mil., St. P. & Pac.	1945-1955	2,100,000	1¾	100.12512	1.73	Harris Trust & Savings Bank.
Denver & Rio Grande Western	1946-1960	2,610,000	2	98.27	2.25	Halsey, Stuart & Co.
Missouri-Kansas-Texas	1946-1952	910,000	1½	99.928	1.52	Central Hanover Bank & Trust Co.
Missouri-Kansas-Texas	1945-1952	952,000	1½	99.65	1.59	Halsey, Stuart & Co.
New York Central	1946-1955	8,800,000	1½	99.019	1.69	Salomon Bros. & Hutzler, et al.
New York Central	1946-1955	7,500,000	1½	99.3799	1.75	Salomon Bros. & Hutzler, et al.
New York Central	1946-1956	17,700,000	1½	99.517	...	Halsey, Stuart & Co., et al.
New York, Chicago & St. L.	1946-1955	1,400,000	1½	99.454	1.61	National City Bank of Cleveland.
Northern Pacific	1946-1955	3,500,000	1½	99.43	1.61	Central Hanover Bank & Trust Co.
New York, Ontario & Western	1945-1955	1,695,000	3	par	3	R. F. C.
Pennsylvania	1946-1960	10,290,000	1¾	100.12766	1.86	Halsey, Stuart & Co.
Pennsylvania	1946-1960	6,000,000	2	100.1799	1.98	Harris, Hall & Co.
Seaboard Air Line	1946-1960	3,810,000	2	99.05	2.14	Halsey, Stuart & Co.
Seaboard Air Line	1945-1960	2,640,000	2	99.759	2.04	Halsey, Stuart & Co., et al.

Representative Equipment Note Issues Sold in 1945

Road	Amount	Max. Term, Years	% of Equipment Cost Covered	Interest Cost, %	Sold to
Alton	\$838,128	5	80	1.5	Northern Trust Co., Chicago
	1,340,000	8	80	1.9	First National Bank, Chicago
	314,000	5	80	1.5	First National Bank, Chicago
	1,946,678	8	80	1.9	First National Bank, Chicago
	599,000	8	80	1.9	First National Bank, Chicago
Baltimore & Ohio	720,000	7	87	1.61	National City Bank, Cleveland
	1,059,750	7	90	1.62	Central Hanover Bank & Trust Co.
	1,200,000	7	86	1.575	Philadelphia National Bank
Bangor & Aroostook	436,800	5	81	1.40	National Commercial Bank & Trust Co., Albany
Boston & Maine	536,914	6	..	1.40	National Commercial Bank & Trust Co., Albany
Chicago, Milwaukee, St. Paul & Pacific	5,315,000	8	..	1.6	Seattle First National Bank
Chicago & North Western	235,578	8	..	1 7/8	First National Bank, Chicago
	3,261,443	8	..	1 7/8	First National Bank, Chicago
Chicago, Burlington & Quincy	3,883,440	10	80	1.59	First National Bank, Chicago
Chicago, Rock Island & Pacific	5,200,000	10	80	1.62	First National Bank, Chicago
Erie	1,320,000	10	..	1.64	National City Bank of Cleveland
	1,848,000	10	..	1.62	Central Hanover Bank & Trust Co.
Florida East Coast	1,969,488	10	75	2 1/4	Chase National Bank
Great Northern	3,825,218	10	80	1.63	Central Hanover Bank & Trust Co.
Gulf, Mobile & Ohio	154,216	8	80	1.69	Manufacturers & Traders Trust Co., Buffalo
	155,144	8	..	1.65	National Commercial Bank & Trust Co., Albany
	376,740	8	80	1.65	National Commercial Bank & Trust Co., Albany
Maine Central	258,413	5	..	1.95	State Street Trust Co., Boston
Minneapolis & St. Louis	607,234	10	80	1.65	Irving Trust Co.
	1,439,220	10	80	1.735	Northwestern National Bank, Minneapolis
New York Central	1,142,080	8	90	1.45	Public National Bank & Trust Co.
	212,160	8	90	1.45	Public National Bank & Trust Co.
New York, New Haven & Hartford	1,421,500	10	80	1.63	Irving Trust Co., New York
Pere Marquette	438,200	10	..	1.609	Cleveland Trust Co.
	467,800	10	..	1.60	National Commercial Bank & Trust Co., Chicago
Southern	1,599,840	6	75	1.375	Florida National Bank, Jacksonville

tiveness, and that, when they support the former, it is only in those situations where the principles happen to parallel their immediate self-interest. There is not much evidence in the experience of the railroads in dealing with their competitors to refute this accusation.

Such necessarily somber reflections

aside, however, it is apparent to all that—relatively to its low place in investors' esteem a few years ago—the railroads' position has made a remarkable comeback; and this movement showed no let-up when the war's end brought a termination to the railroads' prospects for a continuance of traffic and earnings at

peak levels. The railroad committee of the Investment Bankers Association, whose opinions were reported at length in this space a year ago, has again given expression to its informed views of the railroad situation*. As of the late fall

* I. B. A. Daily, November 30, 1945.

Railroads in the Hands of Receivers or Trustees on December 31, 1945

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Long term debt in hands of public	Capital stock in hands of public	Total securities in hands of public	Receiver's or trustee's certificates in hands of public	Principal amount of obligations in default as to principal and/or interest
Alton	959	654	Nov. 25, 1942	\$54,450,493	None	\$54,450,493	None	\$45,350,000
Kansas City, St. Louis & Chicago	157	157	Apr. 30, 1943	None	\$1,864,200	1,864,200	None	None
Louisiana & Missouri River	76	76	Feb. 17, 1944	None	344,300	344,300	None	None
Catonville Short Line	4	4	Jan. 1, 1942	None	2,200	2,200	None	None
Central of Georgia	1,816	1,405	Dec. 19, 1932(a)	51,399,467	None	55,148,201	4,655,569	51,399,467
Central Railroad of New Jersey	654	377	Oct. 31, 1939	50,109,565	11,942,800	62,052,365	None	48,731,000
Chicago, Indianapolis & Louisville	541	512	Dec. 30, 1933	26,071,000	1,818,000	30,211,755	None	26,071,000
Chicago, Rock Island & Pacific	7,752	4,921	June 7, 1933	255,047,600	128,892,512	383,940,112	7,513,771	161,238,600
Chicago, Rock Island & Gulf	635	635	Oct. 31, 1933	None	None	None	None	None
Choctaw, Oklahoma & Gulf	785	785	Oct. 31, 1933	\$8,215,000	None	8,215,000	None	None
Peoria Terminal	29(b)	27(b)	Oct. 31, 1933	764,000	None	764,000	None	764,000
Rock Island, Arkansas & Louisiana	376	376	Aug. 31, 1933	11,453,600	None	11,453,600	None	11,453,600
Rock Island, Memphis Terminal	6(b)	6(b)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Omaha Terminal	3(b)	3(b)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Stuttgart & Southern	21	21	Oct. 31, 1933	None	None	None	None	None
St. Paul & Kansas City Short Line	417	417	Aug. 31, 1933	18,425,525	None	18,425,525	None	18,425,525
Denver & Rio Grande Western	2,386	2,090	Nov. 1, 1935	124,273,000	16,433,200	144,191,200	None	120,216,000
Denver & Salt Lake Western	38	38	Nov. 1, 1935	None	None	3,110,850	None	None
Duluth, South Shore & Atlantic	550	447	Jan. 2, 1937	\$3,822,000	10,827,500	14,649,500	None	3,822,000
Mineral Range	26	26	June 1, 1937	317,071	705,800	1,022,871	None	317,071
Florida East Coast	682	676	Sept. 1, 1931(c)	59,727,866	37,500,000	97,227,866	None	45,000,000
Georgia & Florida	408	363	Oct. 19, 1929	8,253,919	13,382,441	21,991,081	600,000	8,253,919
Georgia, Florida & Alabama	9	130	Nov. 7, 1931(d)	191,000	1,500,000	1,691,000	None	191,000
Hoboken Manufacturers	50	50	July 27, 1943	100,000	400,000	500,000	None	100,000
Meridian & Bigbee River	14	14	June 15, 1933	500,000	300,000	800,000	925,000	500,000
Middletown & Unionville	7,067	6,536	Aug. 17, 1943	350,500	150,000	500,500	None	185,000
Missouri Pacific	0.18	0.18	Apr. 1, 1933	346,219,500	154,639,600	531,786,815	None	335,589,500
Boonville, St. Louis & Southern	25	25	June 1, 1936	30,000	None	30,000	None	30,000
Cairo & Thebes	64	64	Dec. 1, 1937	1,699,000	None	1,699,000	None	1,699,000
Chester & Mount Vernon	7	7	Dec. 1, 1937	None	None	None	None	None
Fort Smith Suburban	3	3	Dec. 1, 1937	None	None	None	None	None
Marion & Eastern	7	7	Dec. 1, 1937	None	None	None	None	None
Missouri Pacific RR. Corp. in Nebr.	191	173	May 1, 1933	None	None	None	None	None
Natchez & Southern	32	32	Dec. 1, 1937	None	None	None	None	None
New Orleans, Texas & Mexico	18	18	Apr. 1, 1933	42,970,000	859,800	43,829,800	None	42,970,000
Asherton & Gulf	146	84	Dec. 1, 1937	None	None	None	None	None
Asphalt Belt	27	27	Dec. 1, 1937	None	None	None	None	None
Beaumont, Sour Lake & Western	37	37	May 1, 1933	None	None	None	None	None
Houston North Shore	1,110	1,056	Dec. 1, 1937	None	None	None	None	None
Houston & Brazos Valley	2(e)	2(e)	Dec. 1, 1937	44,927,700	None	45,323,557	None	44,927,700
International-Great Northern	104	65	Dec. 1, 1937	None	None	None	None	None
Austin Dam & Suburban	39	39	Dec. 1, 1937	None	None	None	None	None
New Iberia & Northern	62	62	Dec. 1, 1937	None	None	None	None	None
Iberia, St. Mary & Eastern	18	18	Dec. 1, 1937	None	None	None	None	None
Orange & Northwestern	606	560	May 1, 1933	None	None	None	None	None
Rio Grande City	45	29	Dec. 1, 1937	None	None	None	None	None
St. Louis, Brownsville & Mexico	317	314	May 1, 1933	None	None	None	None	None
San Antonio Southern	116	116	Dec. 1, 1937	None	None	None	None	None
San Antonio, Uvalde & Gulf	42	19	Dec. 1, 1937	None	None	None	None	None
San Benito & Rio Grande Valley	15	15	Sept. 5, 1942	25,000	None	25,000	None	25,000
Sugar Land	39	29	June 30, 1938	1,022,960	368,400	1,391,360	None	628,000
Murfreesboro-Nashville	1,838	1,158	Oct. 23, 1935	250,787,669	206,155,300	462,175,113	None	193,900,955
New Jersey & New York	19	19	July 31, 1936	None	338,200	338,200	None	None
New York, New Haven & Hartford	448	448	June 2, 1936	14,348,000	12,500,800	28,248,800	None	14,348,000
Hartford & Connecticut Western	61	61	Aug. 5, 1938	2,170,000	3,668,800	5,838,800	None	2,170,000
Old Colony	13	13	Feb. 13, 1937	None	44,900	44,900	None	None
Boston & Providence	548	340	May 20, 1937	34,058,836	58,114,043	92,172,879	570,114	32,228,836
Providence, Warren & Bristol	120	120	June 1, 1937	13,505,784	None	13,505,784	None	12,345,608
New York, Ontario & Western	190	156	Aug. 1, 1905	14,655,600	15,000,000	29,655,600	2,044,350	14,655,600
Pittsburg, Shawmut & Northern	172	172	Dec. 16, 1929	2,728,000	930,300	3,658,300	None	2,728,000
Rio Grande Southern	407	393	May 5, 1938(f)	9,216,000	9,080,300	18,296,300	None	9,216,000
Putland	96	118	Mar. 1, 1945	None	3,606,849	3,606,849	None	None
St. Johnsbury & Lake Champlain	4,925	4,855	Nov. 1, 1932(g)	262,281,529	114,701,526	382,119,919	None	260,797,529
St. Louis-San Francisco	1,607	1,413	Dec. 12, 1935	51,829,395	4,733,500	79,449,100	None	30,564,395
St. Louis Southwestern & Affiliated Cos.	4,150	3,275	Dec. 23, 1930	162,235,450	84,964,792	247,200,242	5,000	147,775,450
Seaboard Air Line	162	162	Feb. 2, 1931	3,665,750	None	3,665,750	None	3,665,750
Seaboard—All Florida	side track	side track	Feb. 2, 1931	166,647	None	166,647	None	166,647
East & West Coast	233	233	Feb. 2, 1931	3,811,103	None	3,811,103	None	3,811,103
Florida Western & Northern	57	57	June 25, 1923	None	None	None	None	None
Tallahassee	46	46	Apr. 27, 1938	None	5,000,000	5,000,000	None	None
Virginia & Truckee	41	41	Feb. 8, 1930	None	None	None	12,734	None
Waco, Beaumont, Trinity & Sabine	1,130	984	Dec. 2, 1932(h)	36,048,718	17,033,700	53,082,418	None	35,138,759
Wisconsin Central	8	8	Sept. 16, 1935	None	7,500	7,500	23,500	None
Yreka Western								

(a) Changed to trusteeship June 19, 1940.

(b) Yard tracks and sidings.

(c) Changed to trusteeship Apr. 21, 1941.

(d) Changed to trusteeship July 12, 1944

(e) Yard switching tracks.

(f) Changed to trusteeship July 21, 1944.

(g) Changed to trusteeship May 16, 1933

(h) Changed to trusteeship Oct. 1, 1944.

Note:—The effort has been made, in the above table, to list only those securities of bankrupt carriers which are actually in the hands of the investing public—and to exclude securities of one carrier held by an affiliated carrier. Where securities are held by other railways not affiliated with the issuing company, however, they are included in the above list as publicly held. Owing to the complexities of some corporate structures, the decision as to the fact of public or other-carrier ownership has perforce, in some instances, been arbitrary. The purpose has been to give a general picture of the public stake in bankrupt carriers rather than a comprehensive tabulation of legal obligations.

of 1945, this committee calls attention to the fact that some railroad stocks have increased in market price from 50 to 100 per cent during the past year. It notes also the continuance of the upward movement in bond prices, and the consequent downward trend of the average interest rate. Comparing the November 15, 1944 and 1945, situation of six typical bond issues, it observes that three of them, in 1945, had been replaced by new issues bearing coupons as much as 1½ per cent lower than the old ones; while the other three were selling at prices representing an interest reduction of from slightly less than one point to more than two points.

This improvement the committee ascribed to: (1) a level of earnings which has developed "safety cushions" in current assets and which has brought about reductions in debt and fixed charges; (2) refunding operations which

Railroads Taken from Receivership or Trusteeship During 1945

Name of Road	Mileage Operated
Bowdon	12
California & Oregon Coast	•
Chicago, Milwaukee, St. Paul & Pacific	10,730
Moore Central	10
Tampa Northern	2
Yosemite Valley	79
Total	10,833

* Removed from receivership in 1944.

have removed "maturity dangers"; (3) more general recognition of the importance of the railroads to the economy. The committee believes it especially significant that railroad security prices have not tumbled with the imminence of revival of competition from other forms of transport; and that falling traffic and wage demands upon the industry have also failed to act as a depressant. The committee interprets this to indicate that general confidence exists in the need of the country for railroad service, with the corollary that such service will continue to be "the very backbone of our domestic transportation system."

Can Passenger Trains Pay?

As an unfavorable factor, the committee mentions the likelihood that passenger traffic will soon become much less remunerative than at present, when it becomes no longer possible to cram the customers "into cars like sardines." It is wary also of a probable decline in average loading per freight car when "there is a surplus of cars available and other railroads are competing for the business." As offsetting factors it mentions improvement in operating efficiency from the use of modern power and equipment, and the reduction in penalty overtime. Nevertheless, the committee says, "the evidence is convincing that a freight rate increase is an absolute necessity if adequate earning power

Summary of Railroad Receiverships and Trusteeships, 1876 to 1945

Roads Placed in Receivership or Trusteeship			Roads Taken from Receivership or Trusteeship*		Roads Placed in Receivership or Trusteeship			Roads Taken from Receivership or Trusteeship*	
Year	No. of roads	Miles	No. of roads	Miles	Year	No. of roads	Miles	No. of roads	Miles
1876....	42	6,662	30	3,840	1911....	5	2,606	13	1,386
1877....	38	3,637	54	3,875	1912....	13	3,784	12	661
1878....	27	2,320	48	3,906	1913....	17	9,020	6	1,159
1879....	12	1,102	65	4,909	1914....	22	4,222	9	1,470
1880....	13	885	31	3,775	1915....	12	20,143	11	3,914
1881....	5	110	29	2,617	1916....	9	4,439	26	8,355
1882....	12	912	16	867	1917....	19	2,486	20	10,963
1883....	11	1,990	18	1,354	1918....	8	3,519	11	763
1884....	37	11,038	15	710	1919....	7	244	8	459
1885....	44	8,836	22	3,156	1920....	10	541	7	380
1886....	13	1,799	45	7,687	1921....	14	1,744	11	4,173
1887....	9	1,046	31	5,478	1922....	12	4,330	15	6,151
1888....	22	3,270	19	1,596	1923....	10	2,218	8	637
1889....	22	3,803	25	2,930	1924....	11	920	14	3,992
1890....	26	2,963	29	3,825	1925....	6	11,368	6	638
1891....	26	2,159	21	3,223	1926....	6	88	12	12,852
1892....	36	10,508	28	1,922	1927....	6	924	5	142
1893....	74	29,340	25	1,613	1928....	1	19	4	209
1894....	38	7,025	42	5,643	1929....	3	634	5	562
1895....	31	4,089	52	12,831	1930....	4	4,752	2	1,048
1896....	34	5,441	58	13,730	1931....	19	5,195	2	102
1897....	18	1,537	42	6,675	1932....	13	11,817	8	394
1898....	18	2,069	47	6,054	1933....	18	21,222	2	298
1899....	10	1,019	32	4,294	1934....	1	81	2	40
1900....	16	1,165	24	3,477	1935....	16	29,018	5	436
1901....	4	73	17	1,139	1936....	4	8	3	122
1902....	5	278	20	693	1937....	23	1,937	2	179
1903....	9	229	13	555	1938....	9	6,194	8	290
1904....	8	744	13	524	1939....	3	733	4	401
1905....	10	3,593	6	679	1940....	•	•	6	3,675
1906....	6	204	8	262	1941....	1	25	9	5,031
1907....	7	317	6	114	1942....	4	961	7	2,230
1908....	24	8,009	3	138	1943....	3	23	6	394
1909....	5	859	12	2,629	1944....	1	•	8	13,096
1910....	7	735	17	1,100	1945....	1	96	5	10,833

* Prior to 1938 these figures covered foreclosure sales only.

Mileage in the Hands of Receivers or Trustees

(Figures to 1944, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1944. Figures for 1945 Compiled by Railway Age.)

Year ended	Miles of road operated by receivers or trustees at close of year	Net change during year in miles of road operated	No. of roads in charge of receivers or trustees at close of year
June 30, 1894	40,819	•	192
1895	37,856	-2,963	169
1896	30,475	-7,380	151
1897	18,862	-11,614	128
1898	12,745	-6,117	94
1899	9,853	-2,892	71
1900	4,178	-5,675	52
1901	2,497	-1,681	45
1902	1,475	-1,022	27
1903	1,185	-290	27
1904	1,323	+138	28
1905	796	-527	26
1906	3,971	+3,176	34
1907	3,926	-45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	-5,273	39
1911	4,593	-664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,353	+7,130	94
Dec. 31, 1916	34,804	-2,550*	80
1917	17,376	-17,428	82
1918	19,208	+1,832	74
1919	16,590	-2,618	65
1920	16,290	-300	61
1921	13,512	-2,778	68
1922	15,259	+1,747	64
1923	12,623	-2,636	64
1924	8,105	-4,518	61
1925	18,687	+10,582	53
1926	17,632	-1,055	45
1927	16,752	-880	40
1928	5,256	-11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	22,545	+9,575	55
1933	41,698	+19,153	78
1934	42,168	+470	80
1935	68,345	+26,177	87
1936	69,712	+1,367	91
1937	70,884	+1,172	109
1938	76,938	+6,054	109
1939	77,013	+75	108
1940	75,270	-1,743	103
1941	69,859	-5,411	91
1942	66,904	-2,955	87
1943	64,758	-2,146	82
1944	50,497	-14,261	76
1945	41,154	-9,343	75

* Represents decrease for six months.

is to be maintained." In this connection, the government's "apparent determination to restrict prices regardless of costs" is not looked on as encouraging—although, perhaps, the committee might feel somewhat more optimistic on this score if it would re-read the expressions of the commissioners in the wartime rate-level cases. The Commission did not then give evidence that it was taking orders from the O. P. A.

Even if the Commission should be laggard in permitting the rate level to follow costs upward with reasonable promptness, the committee does not foresee a crisis, because of the strength which the railroads have accumulated. In fact, it fears that this strength may even prove a temptation to delay the making a "sound readjustment" of charges for railroad service, to give effect to increases in costs.

The opinions of the investment bankers regarding the railroads' credit position is doubly important—from the fact that these men know the situation of the carriers so well, and from the still more significant fact that these same men are among the principal buyers of railroad securities. Of all the evidence that could be given on the railroads' financial progress during 1945, probably nothing is quite so significant as the increase in the optimism of this I. B. A. report, when compared to that of the report which was quoted from in this space a year ago. That this optimism is still, absolutely, of modest proportions and continues to be heavily qualified is an equally significant fact.

The Optimists' View

There are others who follow the railroads' financial situation closely, and whose opinions are worth attention because they have been right before, who take a decidedly hopeful view of the railroads' future—and without any misgivings because of the continuance of government liberality to the railroads' competitors. This school of opinion insists that the railroads' intrinsic superiority as a means of transportation is so pronounced that tax aid to their rivals, however generous, can do little permanent damage to the railroads. Whether this viewpoint is tenable or not, no report on the railroads' situation can be complete which fails to take this view into account, because it has turned out to be right more often than wrong in recent years.

Bonds

Issues of railroad securities—all of them equipment certificates or notes, or refunding of bonds (i.e., no issues of new capital for improvements to fixed property)—are totaled herewith in a

table provided through the courtesy of the Securities and Exchange Commission. Representative issues of equipment certificates and notes are set forth in another table, revealing the continuing low interest rates at which such prime obligations can be marketed. The situation with regard to bankrupt properties is set forth in detail in other tables. Typical among the issues of bonds have been the following:

The Arkansas & Memphis Bridge & Terminal issued \$2,865,000 of first mortgage serial bonds in August, using the proceeds to retire an equal principal amount of 5 per cent first mortgage bonds. The new issue bears varying interest rates according to date of maturity, from 2½ to 4 per cent, and was sold at par at an average interest cost of 2.68 per cent.

The Buffalo Creek issued in November \$2,850,000 of series B 3 per cent first mortgage bonds due in 1995, which it sold at 99.511. The proceeds are to be used to redeem at 105 \$2,881,000 of series A 3¾ per cent first mortgage bonds due in 1965.

In May the Chicago & Eastern Illinois issued \$9,400,000 of 3¾ per cent first mortgage bonds maturing in 1985, to retire an equal amount of 4 per cent bonds, held by the R. F. C., at 103. The new issue was sold at 98.25.

In April the Chicago & North Western issued \$54,000,000 of first mortgage bonds due in 1989, which it sold at an interest cost of 3.03 per cent, using the proceeds to retire approximately an equal amount of 4 per cent bonds.

In November the Burlington sold \$65,000,000 of new first and refunding mortgage 3½ per cent bonds due 1985 at 100.0399, the proceeds to be used to retire \$30,000,000 of 3½ per cent collateral trust bonds due 1965, and \$39,493,000 of 3¾ per cent first and refunding mortgage series of 1974.

The Burlington in December sold an issue of \$49,765,000 of 2½ per cent bonds due 1970 at 100.8.

The Erie in April sold \$33,000,000 of first consolidated mortgage bonds due 1990 and \$40,000,000 due 2000 at an interest cost of 3½ per cent. At the same time a 2 per cent issue of \$5,500,000 due 1953 was sold at 99.33.

During August the Great Northern sold \$75,000,000 of new first mortgage bonds at 98.5679 for a coupon bearing 3½ per cent. Half of the issue matures in 1990 and half in 2000.

The Illinois Terminal in December sold an issue of \$13,500,000 of 4 per cent's due 1970.

The Kansas City Southern in May sold at par an issue of \$7,700,000 of 2½ per cent notes, the proceeds being used to retire obligations bearing interest at 5 per cent. In November the company sold an issue of \$40,000,000 of 30-year first mortgage 4 per cent bonds at 98¾, and \$6,000,000 of 10-year unsecured notes at an interest cost of 2¾ per cent—the proceeds of both issues being used for refunding purposes.

Last May the Kansas, Oklahoma & Gulf issued \$4,400,000 of first mortgage bonds, maturing in 1980, on a 99.059 bid for a 3½ per cent coupon, to aid in redeeming \$4,450,000 of 5 per cent bonds due in 1978.

During October the Lehigh & New England sold \$4,000,000 of first mortgage 3 per cent bonds, due 1975, at 99.5199, to redeem \$5,011,000 of general mortgage 4 per cent bonds due 1965.

Last January the Louisville & Nashville sold \$53,835,000 of 3¾ per cent first and refunding mortgage bonds maturing 2003 at 104.66, to redeem several similar issues with the same maturity date, but bearing interest at 4 and 5 per cent. In July the company sold \$53,119,000 of 2½ per cent first and refunding mortgage bonds due in 2003 at 97.669, to retire \$24,654,000 of 3¾ per cent bonds of the same type due 2003, and \$28,465,000 of 4 per cent unified mortgage bonds due in 1960.

Last January the New York, Chicago & St. Louis sold \$42,000,000 of 3¾ per cent refunding mortgage bonds at 100.529. In May it sold \$58,000,000 of 3¼ per cent refunding mortgage 35-year bonds at 99.779, to retire \$59,875,000 of outstanding 4½'s due 1978.

During October the New York Connecting sold \$25,982,000 of 2½ per cent first mortgage bonds, due in 1975, at 99.2799; the issue being jointly guaranteed by the Pennsylvania and the New Haven. The proceeds were used to redeem an equal principal amount in 3½ per cent first mortgage bonds, due 1965.

In September the Northern Pacific sold \$55,000,000 of 4½ per cent collateral trust bonds, due in 1975, at 98, to redeem an \$81,161,600 issue of 6 per cent refunding and improvement bonds.

The Pennsylvania in January sold \$51,782,000 of 3½ per cent general mortgage bonds due 1985 at 100.609, using the proceeds to retire \$60,000,000 of 4½ per cent debentures. During May it sold \$52,981,000 of 3 per cent general mortgage bonds maturing in 1985 at par, to redeem \$57,730,000 of 3¾ per cent bonds. In October the Pennsylvania assumed liability for the Pennsylvania, Ohio & Detroit when it sold \$31,873,000 of 2½ per cent first and refunding bonds at 99.01, to redeem outstanding 3¾ per cent and 4½ per cent bonds of the subsidiary company.

In March the Pere Marquette redeemed \$52,467,335 of first mortgage bonds, with the aid of \$50,000,000 of 3½ per cent 35-year first mortgage bonds sold at 99.71.

During March the Reading sold \$84,000,000 of 3½ per cent of first and refunding mortgage bonds at 100.59, to retire three outstanding issues due 1947, 1951, and 1997.

The Southern Pacific in September sold an issue of \$125,000,000 of first mortgage bonds due in 1961, 1986, and 1996 at an average interest cost of 3.781 per cent—proceeds being used for refunding.

The Terminal R. R. Association of St. Louis in October sold an issue of \$40,312,000 of 2½ per cent refunding and improvement bonds due 1985 at 101.829.

During July the Texas & Pacific sold \$39,000,000 of 3½ per cent general and refunding mortgage bonds due 1985 at 98.6399, to redeem \$40,956,000 of 5 per cent bonds of the same type.

The Union Pacific in October sold \$81,602,000 of 3 per cent refunding mortgage bonds, due 1990, at 103.3599, to redeem a like amount of 3½ per cent bonds due 1980.

In May the Virginian sold \$60,000,000 3 per cent first lien and refunding bonds, due 1995, at 105.669, to retire \$60,044,000 of 3¾ per cent first and refunding mortgage bonds due 1966.

In February the Wabash sold \$47,000,000 of 3¼ per cent first mortgage bonds, due 1971, at 98.38, redeeming \$47,354,300 of similar 4 per cent bonds.

The Washington Terminal in January sold \$11,000,000 of 2½ per cent first mortgage bonds at 100.81.

In October the Western Maryland sold

\$9,500,000 collateral trust bonds, maturing from 1947 to 1960, with interest varying accordingly, the average being 2.92 per cent. The proceeds will help redeem \$11,614,000 of 5½ per cent first and refunding bonds due in 1977.

In August the Wheeling & Lake Erie sold \$6,000,000 of 2¾ per cent general and refunding mortgage bonds due 1992, at 98.099, retiring \$5,250,000 of 3½ per cent refunding mortgage bonds, and \$943,000 of serial issues.

Dividend Changes

The Atlantic Coast Line paid \$3.75 on its capital stock in 1945 as compared with the \$3.00 in 1944.

The Bangor & Aroostook, paying a total of \$7.50 on its 5 per cent preferred, cleared up its arrearages on that stock during 1945.

The Canadian Pacific paid \$1.25 on ordinary \$100 par value shares in 1945, the highest dividend paid on this stock since 1931 when a total disbursement of \$1.56½ was made. In 1944 only 50 cents was paid in February, the August dividend payment being withheld in the light of a wage increase.

The Chesapeake & Ohio paid dividends amounting to \$3 on its common stock during 1945 as compared with \$3.50 in 1944. In addition to the cash dividend, however, a special dividend was voted whereby one share of Pittston Company common was given for each 40 shares of C. & O. common held. Scrip certificates were issued for fractional shares.

The Chicago & Eastern Illinois decided against paying a dividend on common in 1945 because of the need for cash to expand coal carrying operations.

The Chicago & North Western paid dividends amounting to \$3 on its common v.t.c. stock in 1945 compared with an initial payment of \$5 in 1944.

The Chicago, Burlington & Quincy doubled the 1944 capital stock dividend disbursement in 1945 by paying \$6.

The Cincinnati, New Orleans & Texas Pacific paid \$7 on its common stock in 1945 as compared with \$8 paid in 1944.

The Delaware & Hudson paid \$1 on capital stock in 1945 after having paid no dividend since 1932 when \$1.50 was disbursed.

The Great Northern paid a total of \$3 on its \$6 preference stock in 1945, compared with \$2 in 1944.

The Louisville & Nashville was granted permission for a split stock arrangement whereby \$100 par value stock was exchanged on a two for one basis for \$50 par value capital stock, and an initial dividend of 88 cents was made on this stock in June, 1945.

The Minneapolis & St. Louis made a disbursement of \$3 on its capital stock in 1945 as compared with \$2 in 1944.

The Pere Marquette paid a total of \$3.75 on arrearages of its 5 per cent prior preference stock in 1945.

The Pittsburgh & Lake Erie paid \$4 on its common stock in 1945 compared with a disbursement of \$5 on this stock in 1944.

The Tennessee, Alabama & Georgia paid 35 cents on its capital stock during 1945 as compared with 25 cents paid in 1944.

The Western Maryland reduced its 7 per cent first preferred stock arrearages by \$7 during 1945.

Equipment Prices

IN the accompanying table are presented unit prices of typical motive power and freight and passenger rolling stock ordered during 1945. The source of this information is the finance dockets of the Interstate Commerce Commission in which issues of notes or equipment trust certificates, used in part for financing such purchases, are authorized.

The descriptive information on the equipment thus made available is not extensive and, wherever possible, has been supplemented from other sources.

A considerable variation in price will be noted for equipment which, as far as the information given in the table goes, is identical, or nearly so. This difference, in many cases, can be accounted for by variations in the fittings of the equipment. For example, in the case of automobile-box cars, some may be equipped with loading devices and others not; or more expensive materials may be used in one order than in others.

Freight Car Prices

Number	Type	Construction	Capacity (lb.)	Price	No.	Type	Service	Weight	Traction force lb. or hp.	Price
250	gondola	steel	100,000	\$2,995	5	Diesel-elec.	Pass.	2,000 hp.	182,422	
600	box	steel	100,000	3,338	2	Diesel-elec.	Frt.	5,400 hp.	514,336	
150	twin hop.	steel	100,000	2,870	10	Diesel-elec.	Pass.	4,000 hp.	354,600	
500	box	steel	100,000	3,350	10	Diesel-elec.	Frt.	1,350 hp.	130,830	
200	auto. box	steel	100,000	4,094	8	Diesel-elec.	Pass.		175,000	
500	hopper	steel	100,000	2,798	4	Diesel-elec.	Frt.	4,050 hp.	350,000	
100	box	steel	80,000	3,556	10	4-8-4	Frt.		200,000	
50	hopper	steel	140,000	3,794	8	Diesel-elec.			177,197	
500	flat	composite	100,000	2,200	4	Diesel-elec.			175,457	
25	caboose	composite		4,000	3	Diesel-elec.			168,860	
500	box	lt. wt. steel	100,000	3,231	2	Diesel-elec.	Rd. Sw.	1,000 hp.	96,385	
500	box	composite	100,000	3,360	2	Diesel-elec.	Rd. Sw.	1,000 hp.	96,965	
600	gondola	composite	140,000	3,853	5	Diesel-elec.	Rd. Sw.	1,000 hp.	94,185	
700	box	composite	100,000	3,465	1	Diesel-elec.	Sw.	660 hp.	59,750	
100	cov. hopper	steel	140,000	4,430	3	Diesel-elec.	Sw.	44 ton	38,325	
12	dump	steel		6,974	2	Diesel-elec.	Frt.	690,000	379,521	
500	box	composite	100,000	3,598	7	Diesel-elec.	Sw.	1,000 hp.	78,904	
500	box	composite	100,000	3,554	12	Diesel-elec.	Sw.	660 hp.	60,154	
250	flat	composite	140,000	3,542	3	Diesel-elec.	Sw.	1,000 hp.	78,723	
500	gondola	steel	100,000	3,915	10	Diesel-elec.	Sw.	1,000 hp.	78,550	
1,000	open top hop.	steel	100,000	2,771	2	Diesel-elec.	Pass.		175,164	
350	cov. hopper	steel	140,000	4,407	3	Diesel-elec.	Sw.		78,550	
500	box	steel	100,000	4,072	6	Diesel-elec.	Pass.	4,000 hp.	355,586	
1,000	hopper	steel	100,000	2,730	1	Diesel-elec.	Frt.	462,520	253,134	
500	box	steel	100,000	3,279	2	Diesel-elec.	Frt.	462,520	246,366	
500	hopper	steel	100,000	2,800	3	Diesel-elec.	Frt.	462,520	238,966	
1,000	box	steel	100,000	2,800	6	Diesel-elec.	Sw.	1,000 hp.	79,340	
500	box	steel	100,000	3,813	5	2-8-8-4	Frt.		272,553	
225	auto-box	steel	80,000	3,917	7	Diesel-elec.	Pass.	4,000 hp.	351,581	
75	auto-box	steel	100,000	4,367	5	2-8-8-4	Frt.		272,408	
150	auto-box	steel	80,000	4,702	10	2-8-4	Frt.	469,890	194,799	
50	auto-box	steel	100,000	5,134	3	Diesel-elec.	Road		175,000	
50	cov. hopper	steel	140,000	4,528	3	Diesel-elec.	Frt.	93,000	530,000	
750	box	steel	110,000	3,461	25	4-8-4	Road	471,000	238,854	
250	box	steel	110,000	4,051	1	4-8-4	Road	482,400	290,000	
1,000	box	steel	110,000	3,452	2	Diesel-elec.	Pass.	6,000 hp.	519,000	
2,000	box	steel	110,000	3,026	5	Diesel-elec.	Sw.	248,000	78,941	
500	box	steel	100,000	3,466	8	Diesel-elec.	Sw.	242,300	78,825	
500	box	steel	100,000	3,448	20	4-4-4-4	Pass.	497,200	239,000*	
300	cov. hopper	steel	140,000	4,285	25	4-4-4-4	Pass.	497,200	254,000*	
290	box	steel	100,000	3,900	2	Diesel-elec.	Sw.	200,000	59,750	
200	end door box	steel	100,000	4,100	7	Diesel-elec.	Sw.	200,000	60,000	
10	double side door box	steel	100,000	5,000	3	Diesel-elec.	Sw.	240,000	79,000	
250	box	steel	100,000	3,215	4	Diesel-elec.	Frt.		498,683	
250	box	steel	100,000	3,373	1	Diesel-elec.	Frt.		249,341	
300	flat	steel	100,000	2,963	25	4-4-6-4	Frt.		220,000	

Locomotive Prices

No.	Type	Service	Weight	Traction force lb. or hp.	Price
5	Diesel-elec.	Sw.	242,000	1,000 hp.	\$78,500
3	Diesel-elec.	Sw.		4,000 hp.	349,220
15	Diesel-elec.	Sw.		1,000 hp.	78,500
1	Diesel-elec.	Pass.	616,000	4,000 hp.	353,014
3	Diesel-elec.	Sw.		1,000 hp.	78,500
5	Diesel-elec.	Frt.		5,400 hp.	506,134
10	Diesel-elec.	Pass.		4,000 hp.	358,705
4	Diesel-elec.	Sw.		1,000 hp.	79,043
6	Diesel-elec.	Sw.		1,000 hp.	79,379
1	Diesel-elec.	Sw.		1,000 hp.	79,399
3	Diesel-elec.	Sw.	88,000	660 hp.	59,750
7	Diesel-elec.	Sw.		1,000 hp.	37,840
10	Diesel-elec.	Sw.		660 hp.	59,771

* 45 tenders; 18,000 gal., for these locomotives were priced at \$36,000 each.

Passenger Car Prices

No.	Type	Construction	Weight (lb.)	Price
3	baggage-dorm.	lt. wt. stainless steel		\$81,426
9	diner	lt. wt. stainless steel		96,492
6	tav.-obs.	lt. wt. stainless steel		96,775
12	52-pass. coach	lt. wt. stainless steel		79,641
5	baggage	steel		30,412
12	54-pass. coach	steel		78,877
10	52-pass. coach	steel	115,000	79,645
70	44-pass. coach	steel	120,000	64,000
5	baggage-lounge	steel	122,000	76,000
5	dining	steel	120,000	79,000
5	kitchen-dorm.	steel	139,000	86,000
5	obs.-lounge-buff.	steel	121,700	86,000

Locomotives Ordered and Built in 1945

By **ARTHUR J. McGINNIS**

Associate Editor

THE appended tabulation lists 856 locomotives reported to the *Railway Age* as ordered in 1945 for domestic service, 1,895 locomotives ordered for export from the United States, and 261 ordered in Canada for service there and for export. Domestic orders include 148 steam locomotives ordered by the railroads, 45 from railroad shops and 103

Locomotives Built, 1929-1945

Year	Domestic	U. S. Export	Total
1945	935	1,910	2,845
1944	1,171	78	1,249
1943	1,012	58	1,070
1942	936	11	947
1941	1,047	57	1,104
1940	435	66	501
1939	338	16	354
1938	272	28	300
1937	526	44	570
1936	157	22	179
1935	184	17	201
1934	91	19	110
1933	57	6	63
1932	102	18	120
1931	181	17	198
1930	972	51	1,023
1929	926	139	1,065

Note: Locomotives built for U. S. Government and for lend-lease excluded for years 1942-1944.

from contract builders; 702 Diesel locomotives, of which 606 were ordered by the railroads and 96 by private car lines, industrial companies and the government; and six electric locomotives ordered by railroads. U. S. export purchases, including government orders, comprise 1,641 steam engines, 210 Diesels and 44 electric locomotives.

There were 935 locomotives reported built during the year for domestic service, of which 109 were steam and 826 Diesel, and 1,910 for export, of which 1,817 were steam and 93 Diesel. Domestic steam deliveries were divided 43 from railroad shops and 66 from contract builders. The two Canadian contract builders reported deliveries of 368 steam locomotives, 50 for local service and 318 for export.

The appended list of orders was compiled chiefly from reports received by the *Railway Age* in response to its solicitation of the information from railroads,

Locomotives Ordered, 1929-1945					
Year	Domestic			Total	U. S. Export
	Steam	Diesel	Electric		
1945	148	702	6	856	1,895
1944	74	680	3	757	134
1943	413	635	..	1,048	60
1942	363	894	12	1,269	32
1941	302	1,104	38	1,444	85
1940	207	492	13	712	85
1939	119	249	32	400	40
1938	36	160	29	225	24
1937	173	145	36	354	56
1936	435	77	24	536	22
1935	30	60	7	97	15
1934	72	37	76	185	17
1933	17	25	..	42	7
1932	5	7	..	12	1
1931	62	21	91	174	28
1930	382	18	21	421	20
1929	1,055	80	95	1,230	106

Note: U. S. Government purchases excluded for years 1942-1944.

Domestic Diesel Locomotives Orders by Horsepower and Purchaser

Horsepower	Railroads		Private Car Lines and Others		Total	
	1945	1944	1945	1944	1945	1944
6,000	53	6	1	..	54	6
5,400	11	39	..	..	11	39
4,500	10	..	..	..	10	..
4,050	17	8	..	..	17	8
4,000	16	22	1	..	17	22
3,000	6	..	..	..	6	..
2,700	9	8	..	..	9	8
2,000	32	78	..	..	32	78
1,500	63	..	1	..	64	..
1,350	4	18	..	..	4	18
1,000	303	336	14	..	317	336
660-600	58	26	18	23	76	80
Less than 600	24	26	61	59	85	85
Total	606	598	96	82	702	680

and the contract locomotive builders. The *Railway Age* cannot guarantee the accuracy or completeness of the list or the totals drawn therefrom.

Effort has been made to fill in incomplete reporting of orders and deliveries, to eliminate duplicate reporting of the same order, a result of the uncertainty of deliveries during the war years, and to account for the cancellation of orders—where this information was made available. Within these limitations, a summary and analysis of 1945 orders and deliveries is presented in the accompanying three tables, and a comparison with the totals drawn from lists prepared in preceding years.

The total number of Diesel locomotives ordered as listed can vary. For example, a 6,000-hp. locomotive is comprised of three 2,000-hp. cabs (or four of 1,500-hp. each), which with controls in each of the end cabs, is capable of operation as two locomotives, one of 4,000 hp. and one of 2,000 hp. (or two of 3,000 hp). Similarly, a 5,400-hp. Diesel is made up of four 1,350-hp. units and is frequently operated as two 2,700-hp. locomotives. Other possible divisions of the larger Diesels listed are apparent. In the appended tabulation, the number of cabs in each locomotive is indicated in the column headed Wheel-Arrangement. The horsepower of each locomotive as it is listed generally is that reported by the railroad.

Steam Locomotives Ordered in 1945 For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Alliquippa & Southern	3	0-6-0	Freight	166,000	65,100	22 x 28	October	1946	American
Baltimore & Ohio	10	4-8-2	Freight	375,000	98,000	27 x 32	May	Sept. '46	Company Shops
Chesapeake & Ohio	3	4-8-0	Passenger	798,000	83,350*	Turbine	March	December	Baldwin
Chicago, Rock Island & Pacific	10	2-8-4	Freight	460,000	67,088	26 x 34	February	Dec. Jan. '46	Lima
Delaware & Hudson	5	4-8-4	Freight	467,000	95,800	26 x 32	March	1946	American
New York Central	25	4-8-4	Pass. & Frt.	467,000	61,500	20½ x 32 (4 cyl.)	May	Jan. '46	American
	1	4-8-4	Pass. & Frt.	479,000	61,500	25½ x 32	January	Mar. '46	American

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Pennsylvania	1	4-4-4-4	Passenger	497,500	65,000	19 3/4 x 26 (4 cyl.)	February	November	Baldwin
Reading	24	4-4-4-4	Passenger	497,500	65,000	19 3/4 x 26 (4 cyl.)	February	Mar. '46	Baldwin
Rutland	25	4-4-4-4	Passenger	497,500	65,000	19 3/4 x 26 (4 cyl.)	January	Feb. '46	Company Shops
Virginian	10	4-8-4	Freight	441,300	79,100	27 x 32	November	June '46	Company Shops
Western Maryland	4	4-8-2	Fr. & Pass.	350,000	54,300	26 x 30	March	Feb. '46	American
	5	2-8-4	Freight	458,000	69,350	26 x 34	August	Feb.-Mar. '46	Lima
	12	4-8-4	Freight	.....	.....	.....	December	June '46	Baldwin

United States—Export

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
F. C. de Antioquia, Colombia ...	4	2-8-2	Pass. & Frt.	135,000	26,400	17 x 22	November	....	Baldwin
Belgium Government	80	2-8-0	....	201,000	....	22 x 28	....	....	American
Brazilian Government Rys.	30	4-8-4	....	218,000	....	18 x 28	....	....	American
Chilean State Rys.	12	4-8-2	Pass. & Frt.	231,483	37,454	22 1/2 x 28	October	....	Baldwin
Concorcio Administrador de Em- presas Mineracao, Brazil	2	2-6-2	Freight	78,000	12,200	13 x 20	January	....	Baldwin
Corporacion Boliviana de Fomento (for F. C. Villazon Atocha, Bolivia)	2	2-10-2	Freight	203,400	41,000	22 x 24	April	....	Baldwin
Cundinamarca, Colombia	2	4-8-2	Freight	179,000	30,800	18 1/2 x 22	August	....	Baldwin
F. C. Ecuatorianos, Guayaquil & Quito Ry., Ecuador	2	2-8-0	Freight	145,000	32,150	19 x 22	September	....	Baldwin
Equitable Equip. Co., Honduras	4	2-8-0	Freight	145,000	32,150	19 x 22	November	....	Baldwin
French Supply Commission	1	2-8-0	Freight	102,000	....	....	....	....	American
	80	2-8-2	Freight	250,000	44,500	23 1/2 x 28	December	....	Lima
	160	2-8-2	Freight	250,000	44,500	23 1/2 x 28	October	....	Baldwin
	200	2-8-2	Freight	256,000	....	....	....	....	American
Guayaquil & Quito Ry., for F. C. Sibambe-Cuenca, Ecuador	1	2-8-0	Freight	129,000	27,600	18 x 20	February	....	Baldwin
R. W. Hebard & Co., for Cia Vale do Rio Doce, Brazil	9	2-8-2	Freight	140,000	29,200	19 x 20	September	....	Baldwin
Mogiana Ry., Brazil	3	2-8-2	Freight	181,000	36,300	18 1/2 x 22	June	....	Baldwin
National Rys. of Mexico	8	4-8-4	Pass. & Frt.	392,000	57,000	25 x 30	March	....	Baldwin
	8	4-8-4	Pass. & Frt.	392,000	57,000	25 x 30	July	....	Baldwin
	8	4-8-4	Pass. & Frt.	392,000	....	25 x 28	....	....	American
	8	4-8-4	Pass. & Frt.	392,000	....	25 x 28	....	....	American
North-Western of Brazil Ry.	9	2-10-4	Freight	228,000	41,100	20 x 24	October	....	Baldwin
Parana-Santa Catharina Ry., Brazil	3	4-8-2	Freight	177,000	30,500	19 x 22	February	....	Baldwin
Portuguese Government Rys., Mozambique	6	2-8-2	Shunting	170,000	31,900	21 x 22	May	....	Baldwin
United Fruit Co. (for Cia Agricola de Guatemala)	6	2-8-2	Freight	146,300	27,625	18 x 22	August	....	Baldwin
(for Cia Bananera de Costa Rica)	2	2-8-2	Freight	123,000	22,900	16 x 20	September	....	Baldwin
U. S. Government (for Russia)	102	2-10-0	Freight	212,000	51,500	25 x 28	January	June-Aug.	Baldwin
	8	2-10-0	Freight	212,000	51,500	25 x 28	January	....	Baldwin
	34	0-8-0	....	....	....	....	1945	1945	Porter
	50	0-8-0	....	....	....	....	1945	1945	Dav. Besler
	87	2-10-0	Freight	....	....	....	January	1945	American
(for France)	122	2-8-2	Freight	256,000	44,500	23 1/2 x 28	January	Sept.-Nov.	Baldwin
	138	2-8-2	Freight	256,000	44,500	23 1/2 x 28	January	....	Baldwin
	180	2-8-2	Freight	250,000	44,500	23 1/2 x 28	January	....	Lima
	171	2-8-2	Freight	256,000	44,500	23 1/2 x 28	January	1945	American
(for Export)	89	2-8-2	Freight	256,000	44,500	23 1/2 x 28	January	....	American
	10	2-8-2	Freight	....	....	....	1945	....	Dav. Besler

* Tractive force including booster.

Canada—Including Export

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Canadian Car & Fdy.	1	0-6-0	Sw.	126,000	....	19 x 26	....	....	Montreal
Canadian Pacific	20	4-6-2	Passenger	231,000	34,000	20 x 28	December	1946	Montreal
	20	4-6-2	Passenger	231,000	34,000	20 x 28	December	1946	Canadian
National Rys. of Belgium	60	2-8-0	Pass. & Frt.	201,000	43,300	22 x 28	April	1946	Canadian
	160	2-8-0	Pass. & Frt.	198,000	....	22 x 28	....	....	Montreal

Diesel, Electric, Gas-Mechanical and Other Internal-Combustion Locomotives

Railroad Orders—For Service in the United States

Purchaser	No.	Wheel Arrangement	Service	Type	Weight	Horse-power	Date of Order	Date of Delivery	Builder
Akron, Canton & Youngstown ...	1	B-B	Rd. Ser.	Diesel-Elec.	238,000	1,000	April	November	G.E.-American
Alabama, Tennessee & Northern	4	B-B	Ser.	Diesel-Elec.	238,000	1,000	....	....	G.E.-American
Alton	20	B-B	Freight	Diesel-Elec.	230,000	1,500	April	....	Electro-Motive
	10	B-B	Rd. Ser.	Diesel-Elec.	238,000	1,000	June	Nov.-Dec.	G.E.-American
Atchison, Topeka & Santa Fe ...	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	July	Westinghouse-Baldwin
	7	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	....	Westinghouse-Baldwin
	2	4(B-B)	Freight	Diesel-Elec.	920,000	5,400	June	....	Electro-Motive
	1	B	Sw.	Gas-Mech.	36,000	143	July	....	Whitcomb-Hercules
	8	B-B	Sw.	Diesel-Elec.	230,000	1,000	....	....	G.E.-American
Atlantic & East Carolina	2	B-B	Freight	Diesel-Elec.	230,000	1,350	January	Feb. '46	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	Mar. '46	Electro-Motive
Atlantic Coast Line	6	4(B-B)	Freight	Diesel-Elec.	920,000	5,400	February	....	Electro-Motive
Aurora, Elgin & Fox River Electric	1	B-B	Sw. & Frt.	Diesel-Elec.	90,000	300	September	....	G.E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	October	....	G.E.-Cummins
Boston & Maine	3	2(B-B)	Freight	Diesel-Elec.	460,000	2,700	May	Feb. '46	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	Mar. '46	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	200,000	600	May	Mar. '46	Electro-Motive
Central of Georgia	1	A1A-A1A	Passenger	Diesel-Elec.	310,000	2,000	June	....	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	....	....	G.E.-American
Central of Pennsylvania	5	3(B-B)	Freight	Diesel-Elec.	750,000	4,500	September	....	Westinghouse-Baldwin
Chicago & Eastern Illinois	1	A1A-A1A	Passenger	Diesel-Elec.	310,000	2,000	April	1946	Electro-Motive
Chicago & North Western	7	B-B	Freight	Diesel-Elec.	230,000	1,500	October	....	Electro-Motive
	4	A1A-A1A	Passenger	Diesel-Elec.	310,000	2,000	October	....	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	1946	West.-Fairbanks, Morse
	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	....	Westinghouse-Baldwin
	6	B-B	Sw.	Diesel-Elec.	200,000	660	....	....	G.E.-American
Chicago, Burlington & Quincy ..	28	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	1946	Electro-Motive
(For Ft. Worth & Denver City)	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	August	Apr. '46	Electro-Motive
Chicago, Indianapolis & Louisville	5	2(B-B)	Freight	Diesel-Elec.	460,000	3,000	May	....	Electro-Motive
	3	3(B-B)	Freight	Diesel-Elec.	690,000	4,500	May	....	Electro-Motive
	4	B-B	Freight	Diesel-Elec.	230,000	1,500	May	....	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	....	Electro-Motive
Chicago, Milwaukee, St. Paul & Pacific	10	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	July-Dec.	West.-Fairbanks, Morse
	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	August	Westinghouse-Baldwin
	6	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	September	G.E.-American
Chicago, Rock Island & Pacific ..	6	2(A1A-A1A)	Passenger	Diesel-Elec.	620,000	4,000	June	....	Electro-Motive
	4	3(B-B)	Freight	Diesel-Elec.	690,000	4,050	June	Feb. '46	Electro-Motive

Purchaser	No.	Wheel Arrangement	Service	Type	Weight	Horse- power	Date of Order	Date of Delivery	Builder Electrical Equipment Locomotive Builders Engine Builder
Columbus & Greenville	5	C-C	Rd. & Sw.	Diesel-Elec.	270,000	1,500	September	Jan. '46	Westinghouse-Baldwin
Delaware & Hudson	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	Dec. '44	May	G.E.-American
Delaware, Lackawanna & Western	8	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	Sept.-Nov.	G.E.-American
	5	B-B	Sw.	Diesel-Elec.	250,000	1,000	January	.....	Electro-Motive
	4	3(B-B)	Freight	Diesel-Elec.	690,000	4,500	June	.....	Electro-Motive
	1	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	June	.....	Electro-Motive
Delray Connecting	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	September	G.E.-American
	2	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Denver & Rio Grande Western ..	3	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	April	Mar. '46	Electro-Motive
Donora Southern	2	A-A	Sw.	Diesel-Elec.	70,000	200	February	December	West.-Porter-Cummins
Duluth, South Shore & Atlantic ..	2	B-B	Sw.	Diesel-Elec.	238,000	1,000	.....	.....	G.E.-American
Elgin, Joliet & Eastern	1	C-C	Sw.	Diesel-Elec.	350,000	2,000	April	Feb. '46	Westinghouse-Baldwin
Fairport, Painesville & Eastern ..	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Fonda, Johnstown & Gloversville ..	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Genesee & Wyoming	1	B-B	Frt. & Sw.	Diesel-Elec.	160,000	500	January	November	G.E.-Cummins
Great Northern	10	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	.....	Electro-Motive
	3	B-B	Freight	Diesel-Elec.	230,000	1,500	February	.....	Electro-Motive
	6	2(B-B)	Freight	Diesel-Elec.	460,000	2,700	February	November	Electro-Motive
	2	B-D+D-B	Frt. & Pass.	Electric	720,000	5,000	March	.....	General Electric
Gulf, Mobile & Ohio	20	B-B	Freight	Diesel-Elec.	230,000	1,500	September	Sept. Oct. '46	Electro-Motive
	2	C-C	Passenger	Diesel-Elec.	360,000	2,000	October	Feb. '46	Westinghouse-Baldwin
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	Dec.-Jan. '46	G.E.-American
	2	AIA-AIA	Passenger	Diesel-Elec.	346,000	2,000	November	May '46	G.E.-American
Houston Belt Terminal	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Kansas City Southern	5	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	August	.....	Electro-Motive
Kansas City Terminal	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	August	G.E.-American
Laurinburg & Southern	1	B-B	Sw. & Frt.	Diesel-Elec.	88,000	380	October	.....	G.E.-Cater
Live Oak, Perry & Gulf	2	B-B	Frt. & Sw.	Diesel-Elec.	140,000	600	November	.....	G.E.-Cooper-Bessemer
Long Island	1	B-B	Sw.	Diesel-Elec.	198,500	660	January	September	Westinghouse-Baldwin
	5	B-B	Sw.	Diesel-Elec.	200,000	600	April	Feb. '46	Electro-Motive
Longview, Portland & Northern ..	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	Jan. '46	G.E.-American
Louisville & Nashville	19	B-B	Sw.	Diesel-Elec.	200,000	660	August	Sept.-May '46	G.E.-American
Maine Central	1	B-B	Sw.	Diesel-Elec.	200,000	660	July	October	G.E.-American
Manufacturers	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	September	G.E.-American
Midland Continental	1	B-B	Sw.	Diesel-Elec.	238,000	1,000	.....	.....	G.E.-American
Middletown & Unionville	1	B-B	Sw. & Frt.	Diesel-Elec.	88,000	380	August	.....	G.E.-Cater
Minneapolis & St. Louis	1	3(B-B)	Freight	Diesel-Elec.	690,000	4,050	May	.....	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	238,000	1,000	July	Jan.-Apr. '46	G.E.-American
Minneapolis, St. Paul & Sault Ste. Marie	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	October	Westinghouse-Baldwin
Missouri-Kansas-Texas	1	2(AIA-AIA)	Passenger	Diesel-Elec.	620,000	4,000	August	Sept. '46	Electro-Motive
	7	B-B	Sw.	Diesel-Elec.	250,000	1,000	November	May '46	Electro-Motive
	7	3(B-B)	Freight	Diesel-Elec.	690,000	4,500	December	1946	Electro-Motive
Missouri Pacific	2	2(AIA-AIA)	Passenger	Diesel-Elec.	620,000	4,000	July	June '46	Electro-Motive
	2	AIA-AIA	Passenger	Diesel-Elec.	310,000	2,000	July	June '46	Electro-Motive
(For Int. Great Northern) ...	1	2(AIA-AIA)	Passenger	Diesel-Elec.	620,000	4,000	July	.....	Electro-Motive
	1	AIA-AIA	Passenger	Diesel-Elec.	310,000	2,000	July	.....	Electro-Motive
Missouri Pacific (for Union Ry. of Memphis)	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	April	September	Westinghouse-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	September	Westinghouse-Baldwin
(for St. Louis, Brownsville & Mexico)	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	November	.....	Westinghouse-Baldwin
	2	AIA-AIA	Passenger	Diesel-Elec.	310,000	2,000	August	.....	Electro-Motive
Nashville, Chattanooga & St. Louis	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	September	Dec.-Jan. '46	G.E.-American
	2	B-B	Sw.	Diesel-Elec.	200,000	600	September	Feb.-Mar. '46	G.E.-American
New York Central	5	B-B	Sw.	Diesel-Elec.	250,000	1,000	March	Jan. '46	Electro-Motive
	2	B-B	Freight	Diesel-Elec.	230,000	1,350	July	Jan. '46	Electro-Motive
Northern Pacific	8	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	Sept.-Oct.	Westinghouse-Baldwin
	9	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	July	1946	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	660	June	September	G.E.-American
Pearl River Valley	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	August	G.E.-Cummins
Pennsylvania	3	B-B	Sw.	Diesel-Elec.	200,000	600	January	Jan. '46	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	January	November	Electro-Motive
	10	3(AIA-AIA)	Passenger	Diesel-Elec.	930,000	6,000	November	Sept. '46	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	January	October	Westinghouse-Baldwin
	3	B-B	Sw.	Diesel-Elec.	198,500	660	January	Oct.-Nov.	Westinghouse-Baldwin
Pere Marquette	10	B-B	Sw.	Diesel-Elec.	250,000	1,000	January	Nov.-Jan. '46	Electro-Motive
Phila., Bethlehem & New England	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	April	Westinghouse-Baldwin
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	.....	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Port Huron & Detroit	2	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
St. Louis-San Francisco	6	AIA-AIA	Passenger	Diesel-Elec.	310,000	2,000	August	.....	Electro-Motive
	6	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	September	Westinghouse-Baldwin
St. Louis Southwestern	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	November	Westinghouse-Baldwin
Seaboard Air Line	1	2-D+D-2	Road	Diesel-Elec.	564,000	3,000	June	.....	Westinghouse-Baldwin
	4	AIA-AIA	Passenger	Diesel-Elec.	310,000	2,000	April	1946	Electro-Motive
Southern	3	4(B-B)	Freight	Diesel-Elec.	920,000	5,400	January	August	Electro-Motive
	14	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	June-Aug. '46	Electro-Motive
	10	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	July	June '46	Electro-Motive
	4	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	January	September	G.E.-Cater
(For Cincinnati, New Orleans & Texas Pacific)	3	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	July	June '46	Electro-Motive
	1	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	January	October	G.E.-Cater
(For New Orleans & North- eastern)	1	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	July	June '46	Electro-Motive
	1	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	January	October	G.E.-Cater
(For Alabama Great Southern)	5	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	April	Mar. '46	Electro-Motive
	4	B-B	Freight	Diesel-Elec.	230,000	1,500	April	Mar. '46	Electro-Motive
	3	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	July	June '46	Electro-Motive
(For Alabama Great Southern)	1	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	January	October	G.E.-Cater
Spokane, Portland & Seattle	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	September	Westinghouse-Baldwin
South Omaha Terminal	4	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
State Belt	2*	B-B	Sw.	Diesel-Elec.	230,000	1,000	Dec. '44	August	G.E.-American
Terminal Ry., Alabama State Docks	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	Aug. '44	June	G.E.-American
Texas & Pacific	1	2(AIA-AIA)	Passenger	Diesel-Elec.	620,000	4,000	July	Sept. '46	Electro-Motive
	3	2(AIA-AIA)	Passenger	Diesel-Elec.	620,000	4,000	September	Sept. '46	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	October	Sept. '46	Electro-Motive
(For Fort Worth Belt)	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	October	.....	Electro-Motive
Union	10	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	Aug.-Sept.	G.E.-American
Union Freight	5	B-B	Sw. & Frt.	Diesel-Elec.	88,000	380	October	.....	G.E.-Cater
Union Pacific	2	3(AIA-AIA)	Passenger	Diesel-Elec.	930,000	6,000	March	.....	Electro-Motive
	2	2(AIA-AIA)	Passenger	Diesel-Elec.	620,000	4,000	March	.....	Electro-Motive
	3	(AIA-AIA)	Passenger	Diesel-Elec.	310,000	2,000	March	.....	Electro-Motive
	15	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	.....	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	May	West.-Fairbanks, Morse
	1	3(AIA-AIA)	Frt. & Pass.	Diesel-Elec.	984,000	6,000	August	December	G.E. Fairbanks, Morse
Upper Merion & Plymouth	35	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	August	G.E.-American
Virginian	4	2(B-B+B-B)	Freight	Electric	1,000,000	6,800	September	Mar.-May '47	General Electric
Washington Terminal	6	B-B	Sw.	Diesel-Elec.	238,000	1,000	.....	.....	G.E.-American

Purchaser	No.	Wheel Arrangement	Service	Type	Weight	Horse- power	Date of Order	Date of Delivery	Builder Electrical Equipment Locomotive Builders Engine Builder
Western Pacific	3	(B-B)	Passenger	Diesel-Elec.	690,000	4,500	August	.....	Electro-Motive
Wharton & Northern	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	Sept.-Oct.	Westinghouse-Baldwin
Winona	3	C-C	Frt. & Pass.	Diesel-Elec.	378,000	2,000	July	.....	Westinghouse-Baldwin
Wyandotte Terminal	2	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	January	August	G.E.-Cater.
	3	B-B	Sw.	Diesel-Elec.	198,500	660	April	Oct.-Nov.	Westinghouse-Baldwin

Private Car Line and Other Orders—For Service in the United States

Purchaser	No.	Wheel Arrangement	Service	Type	Weight	Horse- power	Date of Order	Date of Delivery	Builder Electrical Equipment Locomotive Builder- Engine Builder
Alan Wood Steel Corp.	1	B	Sw.	Diesel-Elec.	100,000	300	May	.....	G.E.-Cummins
Alpha Portland Cement Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	July	.....	G.E.-Cummins
Aluminum Co. of America	1	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
American Brass Co.	1	B	Sw.	Diesel-Elec.	70,000	200	March	.....	West.-Whit.-Cummins
American Car & Foundry Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	.....	G.E.-Cummins
American Cyanamid Co., Calco Chemical Div.	1	B-B	Sw.	Diesel-Elec.	130,000	400	November	.....	G.E.-Cummins
American Steel & Wire Co.	1	B-B	Sw.	Diesel-Elec.	198,500	660	September	.....	Westinghouse-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	September	.....	Westinghouse-Baldwin
American Tube & Stamping Co., (Stanley Works)	1*	B	Sw.	Diesel-Elec.	50,000	150	Dec. '44	July	G.E.-Cummins
Ash Grove Lime & Portland Cement	1	B	Sw.	Diesel-Elec.	50,000	150	November	.....	G.E.-Cummins
Bethlehem Steel Corp.	6	B	Sw.	Diesel-Elec.	100,000	300	April	.....	West.-Whit.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	June	.....	West.-Whit.-Cummins
Buffalo Slag Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	April	November	G.E.-Cummins
Carnegie-Illinois Steel Corp.	4	B	Sw.	Diesel-Elec.	70,000	275	October	.....	West.-Whit.-Cummins
	5*	B-B	Sw.	Diesel-Elec.	130,000	400	Dec. '44	.....	G.E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Columbia Steel Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	November	.....	G.E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	160,000	500	November	.....	G.E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	January	July	G.E.-Cummins
Copperweld Steel Corp.	1	B-B	Sw.	Diesel-Elec.	130,000	400	February	.....	G.E.-Cummins
Crosby Naval Stores, Inc.	1	B	Sw.	Diesel-Elec.	50,000	150	January	.....	G.E.-Cummins
Crown Cork & Seal Co.	1	B	Sw.	Diesel-Elec.	70,000	200	October	.....	West.-Whit.-Cummins
Dow Chemical Co.	2	B-B	Sw.	Diesel-Elec.	160,000	500	October	December	G.E.-Cummins
Eastern Gas & Fuel Association ..	1	B	Sw.	Diesel-Elec.	50,000	150	March	November	G.E.-Cummins
Electro-Motive	1	4(B-B)	Freight	Diesel-Elec.	920,000	6,000	July	.....	Electro-Motive
	1	2(AIA-AIA)	Passenger	Diesel-Elec.	620,000	4,000	July	.....	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	600	July	.....	Electro-Motive
Georgia Marble Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	May	.....	G.E.-Cummins
General Electric Co.	1*	B	Sw.	Diesel-Elec.	50,000	150	Dec. '44	July	G.E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	June	.....	G.E.-Cummins
Greenville Mfg. Co.	3	B-B	Sw.	Diesel-Elec.	90,000	300	September	.....	G.E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	October	.....	G.E.-Cummins
Hercules Powder Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	February	November	West.-Whit.-Cummins
Holly Sugar Corp.	1	B	Sw.	Diesel-Elec.	50,000	150	November	.....	G.E.-Cummins
Ingalls Shipbuilding (for stock) ..	1	B-B	Rd.-Sw.	Diesel-Elec.	240,000	1,500	January	Jan. '46	West.-Ingalls-Natl. Sup.
Inland Steel Co.	3	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
Kaiser Co., Inc.	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Koppers Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	.....	G.E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	November	.....	G.E.-Cummins
Lehigh Portland Cement	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	November	G.E.-Cummins
Kickapoo Sand & Gravel	1	B	Sw.	Diesel-Elec.	50,000	150	November	.....	G.E.-Cummins
Lone Star Cement Corp.	1	B	Sw.	Diesel-Elec.	50,000	150	April	.....	G.E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	February	November	G.E.-Cummins
Metal & Thermit Corp.	1*	B	Sw.	Diesel-Elec.	50,000	150	Dec. '44	May	G.E.-Cummins
Metropolitan Edison Co.	1	B	Sw.	Diesel-Elec.	50,000	150	October	.....	G.E.-Cummins
Monarch Cement Co.	1	B	Sw.	Diesel-Elec.	50,000	150	January	July	G.E.-Cummins
National Tube Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	October	.....	G.E.-Cummins
Nekoosa Edwards Paper Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	June	.....	G.E.-Cummins
New England Coal & Coke	1	B	Sw.	Diesel-Elec.	50,000	150	March	October	G.E.-Cummins
New Jersey Zinc Co.	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
North American Cement Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	October	.....	G.E.-Cummins
Pennsylvania Electric Co.	1	B	Sw.	Diesel-Elec.	50,000	150	October	.....	G.E.-Cummins
Pullman-Standard Car Mfg. Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	July	.....	G.E.-Cummins
Ralston Steel Car Co.	1	B	Sw.	Diesel-Elec.	50,000	150	February	October	G.E.-Cummins
St. Joseph Lead Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	January	July	G.E.-Cummins
Singer Mfg. Co.	1	B-B	Sw.	Diesel-Elec.	198,500	660	February	November	Westinghouse-Baldwin
Solvay Process Co.	3	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Southwestern Portland Cement ..	1	B-B	Sw.	Diesel-Elec.	130,000	400	November	.....	G.E.-Cummins
Spreckles Sugar Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	November	.....	G.E.-Cummins
Studebaker Corp.	2	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
Union Oil Co. of Calif.	1	B-B	Sw.	Diesel-Elec.	130,000	550	March	.....	West.-Whit.-Cummins
U. S. Government	6	B-B	Sw.	Diesel-Elec.	240,000	1,000	April	July-Aug.	Westinghouse-Baldwin
U. S. Navy Dept.	2	B-B	Sw.	Diesel-Elec.	160,000	650	May	.....	West.-Whit.-Buda
	1	B-B	Sw.	Diesel-Elec.	88,000	380	February	February	G.E.-Cater.
	1	B	Sw.	Diesel-Elec.	50,000	150	April	.....	G.E.-Cummins
Wallingford Steel Co.	1	B	Sw.	Diesel-Elec.	50,000	150	February	October	G.E.-Cummins
Warner Co.	1	B-B	Sw.	Diesel-Elec.	198,500	660	July	November	Westinghouse-Baldwin
Weirton Steel Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	August	.....	G.E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	200,000	660	.....	.....	G.E.-American
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	.....	G.E.-American
Wheeling Steel Corp.	2	B-B	Sw.	Diesel-Elec.	200,000	600	July	.....	Electro-Motive
Western Indiana Gravel	1	B	Sw.	Diesel-Elec.	50,000	150	January	October	G.E.-Cummins

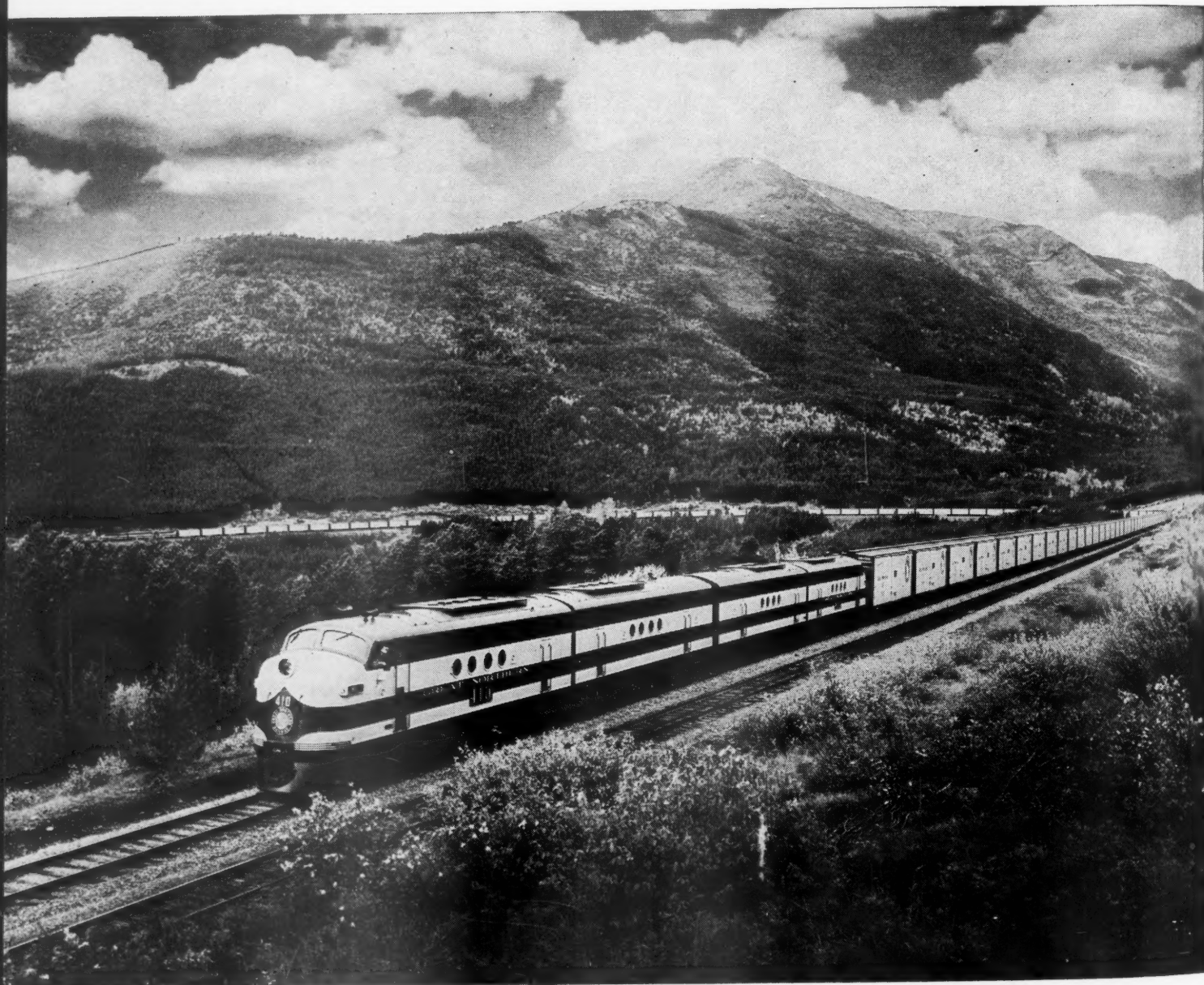
United States—Export

Purchaser	No.	Wheel Arrangement	Service	Type	Weight	Horse- power	Date of Order	Date of Delivery	Builder Electrical Equipment Locomotive Builder- Engine Builder
American Smelting & Refining Co., Mexico	4	B-B	Sw.	Diesel-Elec.	198,500	660	August	October	Westinghouse-Baldwin
Amerlux Steel Products, Brazil ..	1	B	Sw.	Diesel-Elec.	50,000	150	June	.....	Whitcomb-Cummins
Braden Copper Co., Chile	2	B-B	Sw.	Diesel-Elec.	100,000	650	May	.....	West.-Whit.-Sterling
Canadian Allis Chalmers	1	B	Sw.	Diesel-Elec.	50,000	150	September	.....	G.E.-Cummins
Canadian General Electric Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	August	.....	G.E.-Cummins
Canadian Pacific	14	B-B	Sw.	Diesel-Elec.	230,000	1,000	December	1946	G.E.-American
R. Carrion, Inc., Puerto Rico	1	B	Sw.	Diesel-Mech.	50,000	190	July	.....	Whitcomb-Cater.
Central Andorra, Cuba	1	B-B	Sw.	Diesel-Elec.	90,000	300	February	November	G.E.-Cummins
Central do Brazil	6	4-6+6-4	Frt. & Pass.	Electric	364,000	3,960	May	Sept.-Nov. '46	West.-General Electric
	34	B-B	Sw.	Diesel-Elec.	230,000	1,000	.....	Mar.-Oct.	G.E.-American
Cerveceria Montezuma, Mexico ..	1	B	Sw.	Diesel-Elec.	70,000	200	June	.....	West.-Whit.-Cummins
Christmas Island Phosphate, Australia	2	B-B	Sw.	Diesel-Elec.	88,000	380	September	.....	West.-Whit.-Cater.

Purchaser	No.	Wheel Arrangement	Service	Type	Weight	Horse- power	Date of Order	Date of Delivery	Builder Electrical Equipment- Locomotive Builder- Engine Builder
Dominion Steel & Coal Corp., Ltd., Canada	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	.....	G.E.-Cummins
Eastern Sugar Associates, Puerto Rico	1	C	Sw.	Diesel-Elec.	40,000	190	April	.....	Whitcomb-Cater.
Francisco Sugar Co. (for Cia. Azucarera Elia, Cuba)	1	B-B	Sw.	Diesel-Elec.	198,500	660	November	.....	Westinghouse-Baldwin
French Supply Commission	24	C-C	Road & Sw.	Diesel-Elec.	276,000	1,500	September	.....	Westinghouse-Baldwin
	2	B-B	Sw.	Diesel-Elec.	100,000	400	October	.....	West-Whit-Cummins
Great Winnipeg Water District, Canada	1	B-B	Sw. & Frt.	Diesel-Elec.	88,000	380	May	.....	G.E.-Cater.
M. & E. Hayot, F. W. Indies ...	1	B	Sw.	Diesel-Mech.	40,000	131	November	.....	Whitcomb-Cater.
R. W. Hebard & Co., Brazil ...	2	B-B	Sw.	Diesel-Elec.	120,000	550	June	.....	West-Whit-Cummins
Industrias Votorantim, Brazil ..	3	B-B	Sw.	Electric	80,000	500	July	.....	General Electric
National Harbors Board, Canada	1	B-B	Sw.	Diesel-Elec.	88,000	380	August	.....	G.E.-Cater.
National Rys. of Mexico	2	C-C	Pass. & Frt.	Diesel-Elec.	360,000	2,000	September	September	Westinghouse-Baldwin
	7	2(B-B)	Freight	Diesel-Elec.	460,000	2,700	March	.....	Electro-Motive
		7-2(B-B)	Freight	Diesel-Elec.	460,000	2,700	May	.....	Electro-Motive
Paulista Ry., Brazil	6	B-B	Sw.	Electric	120,000	....	August	.....	General Electric
	6	2-C+C-2	Passenger	Electric	364,000	....	October	.....	G.E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	August	.....	General Electric
Port of Rio de Janeiro, Brazil ..	2	B-B	Sw.	Diesel-Elec.	90,000	300	February	.....	G.E.-Cummins
W. A. Ramsay, Ltd. (For Lihue Plantation Co., Hawaii)	3	B	Sw.	Diesel-Elec.	50,000	150	September	.....	G.E.-Cummins
Santa Catharina, Brazil	6	B	Sw.	Diesel-Elec.	88,000	380	February	.....	G.E.-Cummins
Singer Mfg. Co., Canada	1	B-B	Sw.	Diesel-Elec.	88,000	380	August	.....	G.E.-Cater.
Sorocabana Ry., Brazil	10	B+B	Frt. & Pass.	Diesel-Elec.	94,000	380	August	.....	G.E.-Cater.
	42	C+C	Frt. & Pass.	Diesel-Elec.	140,000	660	September	.....	G.E.-Cooper-Bessemer
	15	1-C+C-1	Frt. & Pass.	Electric	286,500	1,940	September	.....	General Electric
	11	2-6+6-2	Frt. & Pass.	Electric	287,000	1,940	November	.....	Westinghouse
Temperleys, Haslehust & Co., Egypt	1	B	Sw.	Diesel-Elec.	40,000	150	July-Dec. '47	.....	West-Whit-Cummins
U. S. Government (for France) .30		....	Sw.	Diesel-Elec.	234,000	660	October	.....	Westinghouse-Baldwin

* Not listed last year.

* * *



On the Great Northern—106 cars with a 5,400-hp. Diesel at head end and a 4,000-hp. helper at rear

Railroads Order 1,269 Passenger Cars

By **ARTHUR J. McGINNIS**
Associate Editor

ACCORDING to reports received by the *Railway Age*, there were 2,998 passenger-train cars ordered during 1945 for domestic service and 49 for export and there were 856 built for domestic

service and none for export. The railroads ordered 1,269 passenger cars, the U. S. War Department 1,700 troop kitchen, sleeping and hospital cars, the General Motors Corporation 4 Astra

Liners and the H. P. Hood Company 25 express refrigerator and milk cars. The 49 cars for export are for the National Railways of Mexico. In Canada the
(Continued on page 99)

Passenger-Train Cars Ordered, 1920-1945						
Year	Railroad Express Refrigerator and Milk	Passenger	Contract Express Refrigerator and Milk	Pullman Company	Total Domestic	U. S. Export
1945	100	2,873	25	...	2,998	49
1944	...	715	...	...	715	374
1943	...	1,670	...	...	1,670	...
1942	...	34	...	...	34	...
1941	31	318	...	197	546	27
1940	6	311	...	53	370	21
1939	...	194	...	125	319	28
1938	82	102	...	84	268	...
1937	40	243	80	171	564	...
1936	50	397	...	1	448	...
1935	6	55	55	10	126	...
1934	95	318	...	8	421	15
1933	2	11	...	3	16	...
1932	5	32	2	...	39	...
1931	5	5	...	1	11	21
1930	41	50	486	102	679	15
1929	84	305	1,176	550	2,315	108
1928	133	80	980	850	2,287	35
1927	86	25	1,293	20	1,542	47
1926	62	45	1,321	40	1,987	...
1925	44	50	1,527	40	2,140	68
1924	49	62	1,582	310	2,704	25
1923	30	86	1,064	587	2,191	5
1922	37	...	1,843	245	2,425	10
1921	1	50	157	...	308	145
1920	33	30	1,082	10	1,613	114

Source: 1945—Railway Age; all other—American Railway Car Institute.

Passenger-Train Cars Delivered			
Year	For Domestic Service	U. S. Export	Total
1945	856	...	856
1944	995	...	995
1943	675	21	696
1942	393	11	404
1941	363	14	377
1940	250	28	278
1939	273	...	273
1938	420	4	420
1937	621	...	621
1936	189	...	189
1935	202	...	202
1934	275	15	290
1933	9	...	9
1932	39	...	39
1931	243	21	264
1930	1,520	40	1,560
1929	2,419	128	2,547
1928	1,549	121	1,670
1927	2,007	42	2,049
1926	2,798	111	2,909
1925	2,312	42	2,354
1924	2,332	54	2,386
1923	1,888	45	1,933
1922	908	156	1,064
1921	1,162	49	1,211
1920	751	135	886

Source: 1945—Railway Age; all other—American Railway Car Institute.

Passenger-Train Cars Ordered — 1945

Purchaser	No.	Class	Length Ft. In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder	
Alton	15 AC	Coach	85 0	63	120,000	July	Oct. '46	Amer. Car & Fdy.	
Atchison, Topeka & Santa Fe	7	Postal	63 10	..	92,500	June	Aug. '46	Amer. Car & Fdy.	
	18	Mail-Bag.	73 10	..	97,000	June	Aug. '46	Amer. Car & Fdy.	
	16 AC	Lunch Ctr.-Diner	85 0	38	122,000	June	Sept. '46	Budd	
	49 AC	Sleeping	..	..	..	July	July '46	Pullman-Standard
	45 AC ¹	Coach	..	52	..	Aug. '44	May-June '46	Pullman-Standard	
	3 AC ¹	Dorm.-Bag.	..	..	..	Aug. '44	July '46	Pullman-Standard
	3 AC ¹	Dorm.-Lounge	..	..	..	Aug. '44	July '46	Pullman-Standard
	1 AC ¹	Chair-Club	..	..	..	Aug. '44	July '46	Pullman-Standard
Atlantic Coast Line	7 AC ¹	Coach	85 0	54	117,000	Dec. '44	..	Budd	
	2 AC ¹	Coach	85 0	54	117,000	January	..	Budd	
	1 AC	Coach	85 0	54	117,000	February	..	Budd	
Baltimore & Ohio	8 AC	Bed.-Roomette	84 9	20	133,600	October	July-Sept. '46	Pullman-Standard	
Bangor & Aroostook	1	Bag.-Exp.	73 7	..	101,900	May	June '46	Amer. Car & Fdy.	
Boston & Maine	8 AC	Coach-Smoking	84 6	66	..	November	1946	Pullman-Standard	
	2 AC	Coach-Smok- Lnge.-Bag	84 6	44	..	November	1946	Pullman-Standard	
	2 AC	Restaurant-Lnge.	84 6	42	..	November	1946	Pullman-Standard	
Canadian National	10	Baggage	73 6	..	..	October	..	National Steel
	5	Mail-Exp.	73 6	..	..	October	..	National Steel
Central of Georgia	4 AC	Coach	85 0	60	114,500	July	Sept. '46	Amer. Car & Fdy.	
	4 AC	Div.-Coach	85 0	68	114,500	July	Sept. '46	Amer. Car & Fdy.	
	1 AC	Coach-Buff	85 0	48	116,000	July	Sept. '46	Amer. Car & Fdy.	
	1 AC	Coach-Bag.	85 0	56	110,500	July	Sept. '46	Amer. Car & Fdy.	
Chesapeake & Ohio	24 AC	Coach	..	..	..	August	Oct. '46	Budd
	3 AC	Diner	..	..	..	August	Oct. '46	Budd
	3 AC	Kit.-Lunch	..	..	..	August	Oct. '46	Budd
Chicago & Eastern Illinois	7 AC ¹	Coach	..	60	..	Dec. '44	1946	Pullman-Standard	
	1 AC ¹	Coach-Mail-Bag.	..	40	..	Dec. '44	1946	Pullman-Standard	
	1 AC ¹	Diner	..	36	..	Dec. '44	1946	Pullman-Standard	
	1 AC ¹	Parlor-Obs.	..	28	..	Dec. '44	1946	Pullman-Standard	
	1 AC ¹	Mail-Bag.-Dinette	..	20	..	Dec. '44	1946	Pullman-Standard	
Chicago & North Western	12 AC	Sleeping	82 10	24	135,720	November	Oct.-Nov. '46	Pullman-Standard	
Chicago, Burlington & Quincy	3	Baggage	72 8	..	95,000	August	1946	Budd	
	2	Bag.-Mail	85 0	..	107,000	August	1946	Budd	
	2 AC	Bag.-Tav.	85 0	37	116,000	August	1946	Budd	
	2 AC	Coach	85 0	50	..	..	..	..
	6 AC	Coach	85 0	24 (dome)	134,000	August	1946	Budd	
	2 AC	Diner	85 0	24 (dome)	133,000	August	1946	Budd	
	2 AC	Parlor-Obs.	85 0	48	141,000	August	1946	Budd	
	2 AC	Parlor-Obs.	85 0	29	24 (dome)	129,000	August	1946	Budd
	3	Baggage	85 0	..	..	October	1946	Budd
	7 AC	Coach	85 0	..	..	October	1946	Budd
	6 AC	Sleeping	85 0	..	..	October	1946	Budd
	3 AC	Sleeping-Tav.-Obs.	85 0	..	..	October	1946	Budd
	3 AC	Coff.Sh.-Tav.	85 0	..	..	October	1946	Budd
	3 AC	Diner	85 0	..	..	October	1946	Budd

Purchaser	No.	Class	Length Ft. in.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Chicago, Rock Island & Pacific	16 AC	Coach	82 10	68	.....	May	Apr.-June '46	Pullman-Standard
	11 AC	Coach	82 10	48	.....	May	Apr.-June '46	Pullman-Standard
	5 AC	Sleeping	82 10	18	.....	May	Apr.-June '46	Pullman-Standard
	2 AC	Parlor-Obs.	83 3 1/2	31	.....	May	Apr.-June '46	Pullman-Standard
	1 AC	Parlor	82 10	31	.....	May	Apr.-June '46	Pullman-Standard
	1 AC	Lnge.-Buff.-Obs.	83 3 1/2	44	.....	May	Apr.-June '46	Pullman-Standard
	1 AC	Coach-Parlor-Buff.	82 10	48	.....	May	Apr.-June '46	Pullman-Standard
	4 AC	Diner	82 10	..	.....	May	Apr.-June '46	Pullman-Standard
	3 AC	Lunch Ctr.-Dorm.	82 10	..	.....	May	Apr.-June '46	Pullman-Standard
	3 AC	Bedroom-Lounge	82 10	24	.....	May	Apr.-June '46	Pullman-Standard
	1 AC	Dorm.-Bag.	..	..	.....	May	Apr.-June '46	Pullman-Standard
	3	Postal-Bag.	70 8	..	.....	May	Apr.-June '46	Pullman-Standard
	2	Baggage	77 10	..	.....	May	Apr.-June '46	Pullman-Standard
Denver & Rio Grande Western	1	Baggage	85 0	..	.....	October	.....	Budd
	4	Coach	85 0	52	.....	October	.....	Budd
	5	Sleeping	85 0	..	.....	October	.....	Budd
	1	Dorm.-Cafe	85 0	50	.....	October	.....	Budd
	1	Diner	85 0	48	.....	October	.....	Budd
	1	Sleeping-Obs.	85 0	..	.....	October	.....	Budd
General Motors Corp.	1 AC	Astra Liner Coach	..	..	.....	November	1946	Pullman-Standard
	1 AC	Astra Liner Slpr.	..	..	.....	November	1946	Pullman-Standard
	1 AC	Astra Liner Diner	..	..	.....	November	1946	Pullman-Standard
	1 AC	Astra Liner Lounge-Obs.	..	75	.....	November	1946	Pullman-Standard
Great Northern	5 AC	Sleeping	..	..	.....	April	1946	Pullman-Standard
H. P. Hood & Sons	5	Milk Refrig.	..	..	.....	January	Jan. '46	General American
	20	Milk Refrig.	..	..	.....	March	Feb.-Mar. '46	General American
Illinois Central	17 AC	Coach	85 0	56	115,492	August	July-Sept. '46	Pullman-Standard
	4 AC	Coach	85 0	48	115,416	August	July-Sept. '46	Pullman-Standard
Illinois Terminal	8 1/2	M. U. Coach	..	..	.....	February	.....	St. Louis Car
Long Island	5	D.D. Motor Coach	80 8 3/4	134	125,000	July	May '46	Company Shops
	5	D.D. Trailer Cch.	80 8 3/4	132	98,200	July	May '46	Company Shops
Maine Central	8 AC	Coach	84 6	66	.....	November	1946	Pullman-Standard
	2 AC	Coach-Bag.	84 6	44	.....	November	1946	Pullman-Standard
	2 AC	Restaurant-Lnge.	84 6	42	.....	November	1946	Pullman-Standard
Missouri-Kansas-Texas	1	Bag.-Mail	72 10	..	99,730	August	Oct.-Dec. '46	Pullman-Standard
	3 AC	Chair	85 0	54	117,860	August	Oct.-Dec. '46	Pullman-Standard
	1 AC	Chair-Lounge	85 0	..	118,392	August	Oct.-Dec. '46	Pullman-Standard
	1 AC	Diner	85 0	36	125,137	August	Oct.-Dec. '46	Pullman-Standard
	7 AC	Sleeping	85 0	..	136,244	August	Oct.-Dec. '46	Pullman-Standard
	1 AC	Lounge-Obs.	85 0	..	122,940	August	Oct.-Dec. '46	Pullman-Standard
Missouri Pacific	1	Bag.-Exp.	85 0	..	110,000	July	Apr. '46	Amer. Car & Fdy.
	2	Bag.-Mail	85 0	..	112,000	July	Apr. '46	Amer. Car & Fdy.
	3 AC	Coach	85 0	52	110,000	July	Apr. '46	Amer. Car & Fdy.
	5 AC	Coach	85 0	64	110,000	July	Apr. '46	Amer. Car & Fdy.
	4 AC	Coach	85 0	66	110,000	July	Apr. '46	Amer. Car & Fdy.
	3 AC	Diner	85 0	44	121,000	July	Apr. '46	Amer. Car & Fdy.
	1 AC	Diner-Lounge	..	..	..	July	Apr. '46	Amer. Car & Fdy.
	2	Bag.-Mail	..	..	..	July	.....	Amer. Car & Fdy.
	2 AC	Coach-Grill	..	..	..	July	.....	Amer. Car & Fdy.
	6 AC	Deluxe Coach	..	..	..	July	.....	Amer. Car & Fdy.
(For Int. Great Northern)	22 AC	Sleeping	85 0	..	140,000	July	Apr. '46	Pullman-Standard
	2	Bag.-Mail	..	..	..	July	.....	Amer. Car & Fdy.
	2 AC	Dormitory	..	..	..	July	.....	Amer. Car & Fdy.
	2 AC	Div.-Coach	..	..	..	July	.....	Amer. Car & Fdy.
	1 AC	Deluxe Coach	..	..	..	July	.....	Amer. Car & Fdy.
	2 AC	Diner-Lounge	..	..	..	July	.....	Amer. Car & Fdy.
	6 AC	Sleeping	..	..	..	July	.....	Pullman-Standard
National Rys. of Mexico	35	Coach	..	..	..	September	1946	Pullman-Standard
	7	Express	73 10	..	89,500	October	June '46	Amer. Car & Fdy.
	7	Mail-Exp.	63 10	..	83,000	October	June '46	Amer. Car & Fdy.
New York Central	50	Baggage	73 7	..	100,000	September	June '46	Amer. Car & Fdy.
	50	Baggage	..	..	..	December	.....	Amer. Car & Fdy.
	8	Bag.-Mail or Postl	..	..	..	December	.....	Amer. Car & Fdy.
	112	Sleeping & other	..	..	..	December	Sept. '46-Mar. '47	Budd
	200	Sleeping & other	..	..	..	December	Sept. '46-Mar. '47	Pullman-Standard
New York, New Haven & Hartford	100 AC	Coach	..	78	..	December	Sept.-Dec. '46	Pullman-Standard
	10 AC	Diner	..	..	..	December	Sept.-Dec. '46	Pullman-Standard
	15 AC	Grill	..	..	..	December	Sept.-Dec. '46	Pullman-Standard
	55 AC	Lnge.-Parlor-Obs.	..	..	..	December	Sept.-Dec. '46	Pullman-Standard
Northern Pacific	6 AC	Diner	82 10	40	..	August	Sept. '46	Pullman-Standard
	6 AC	Dorm.-Mail	82 10	..	..	August	Sept. '46	Pullman-Standard
	6	Water-Baggage	82 10	..	..	August	Sept. '46	Pullman-Standard
	18 AC	Sleeping	82 10	..	..	August	Oct. '46	Pullman-Standard
	6 AC	Sleeping-Obs.	82 10	..	..	August	Oct. '46	Pullman-Standard
Pennsylvania	65 AC	Coach	85 0	44	120,000	June	Oct. '46	Company Shops
	5 AC	Coach	85 0	44	120,000	September	Oct. '46	Company Shops
	5 AC	Dining	85 0	68	120,000	September	Dec. '46	Company Shops
	5 AC	Dorm.-Kitchen	85 0	..	139,000	September	Nov. '46	Company Shops
	5 AC	Bag.-Lounge	85 0	28	122,000	September	Oct. '46	Company Shops
	5 AC	Lnge.-Buff.-Obs.	85 0	53	121,700	September	Nov. '46	Company Shops
	7 AC	Coach	85 0	52	115,000	Dec. '44	June '46	Budd
	2 AC	Coach	85 0	52	115,000	January	June '46	Budd
	1 AC	Coach	85 0	52	115,000	February	June '46	Budd
Richmond, Fredericksburg & Potomac ..	4 AC	Coach	85 0	50	116,500	August	June '46	Amer. Car & Fdy.
	1 AC	Parlor-Cafe	85 0	40	118,000	August	June '46	Amer. Car & Fdy.
St. Louis-San Francisco	1	Bag.-Mail	72 10	..	99,730	August	Oct.-Dec. '46	Pullman-Standard
	2 AC	Chair	85 0	54	117,860	August	Oct.-Dec. '46	Pullman-Standard
	1 AC	Chair-Lounge	85 0	..	118,392	August	Oct.-Dec. '46	Pullman-Standard
	1 AC	Diner	85 0	36	125,137	August	Oct.-Dec. '46	Pullman-Standard
	6 AC	Sleeping	85 0	..	136,244	August	Oct.-Dec. '46	Pullman-Standard
	1 AC	Lounge-Obs.	85 0	..	122,940	August	Oct.-Dec. '46	Pullman-Standard
	2	Mail-Bag.	..	..	..	August	1946	Pullman-Standard
	2 AC	Chair-Dorm.	..	..	..	August	1946	Pullman-Standard
	8 AC	Chair	..	..	..	August	1946	Pullman-Standard
	10 AC	Sleeping	..	..	..	August	1946	Pullman-Standard
	2 AC	Diner-Lnge.-Obs.	..	..	..	August	1946	Pullman-Standard
Texas & Pacific	5	Mail-Bag.	85 0	..	105,000	July	Sept. '46	Amer. Car & Fdy.
	5	Bag.-Exp.	85 0	..	95,000	July	Sept. '46	Amer. Car & Fdy.
	4 AC	Dorm.-Coach	85 0	52	110,000	July	Sept. '46	Amer. Car & Fdy.
	6 AC	Div. Coach	85 0	64	110,000	July	Sept. '46	Amer. Car & Fdy.
	5 AC	Coach	85 0	66	110,000	July	Sept. '46	Amer. Car & Fdy.
	2 AC	Diner-Lounge	85 0	50	120,000	July	Sept. '46	Amer. Car & Fdy.
	2 AC	Diner	85 0	44	120,000	July	Sept. '46	Amer. Car & Fdy.
	11 AC	Sleeping	85 0	23	130,000	July	Sept. '46	Pullman-Standard
	2 AC	Sleeping-Lounge	85 0	40	130,000	July	Sept. '46	Pullman-Standard
	6 AC	Sleeping	85 0	24	130,000	July	Sept. '46	Pullman-Standard
U. S. War Dept.	75	Hospital	84 6	40	153,500	January	Aug. '46	Amer. Car & Fdy.
	25	Hospital	84 6	40	153,500	January	Aug. '46	Amer. Car & Fdy.
	400	Troop Kitchen	54 2 1/2	..	87,600	June	December	Amer. Car & Fdy.
	250	Troop Sleepers	..	..	..	June	Nov.-Dec.	Pullman-Standard
	950	Troop Sleepers	..	..	..	June	.....	Pullman-Standard
Western Pacific	18 1/2	Unspecified	..	..	..	October	.....	Budd

AC—Indicates cars are air-conditioned.

1 Not listed last year.

2 Four 2-car units.

3 Two 10-car trains plus one extra "vista dome" coach and one extra sleeper (four cars originally ordered in 1941).

49,063 Freight Cars Ordered in 1945

By ARTHUR J. MCGINNIS
Associate Editor

ACCORDING to reports received by the *Railway Age*, there were 39,039 freight cars ordered here in 1945 for domestic service and 10,024 for export. The railroads ordered 36,678 cars, allocating 11,473 to their own shops and 25,205 to contract builders; and private car lines, industrial companies and government departments the remaining 2,361 domestic cars, 550 from company shops and 1,811 from contract builders.

There were 44,541 cars reported delivered for domestic service during the year, 12,726 from railroad and private line shops and 31,815 from contract shops, and 10,564 for export, chiefly for the U. S. government. (December deliveries are partially estimated.)

Canadian companies reported 11,430 cars ordered last year, 3,845 for local service and 7,585 for export, and deliveries of 13,595 cars, 3,304 for service in Canada and 10,291 for export.

The cars ordered in 1945 are listed in detail in the appended table. The volume of orders and deliveries are summarized and analyzed in the three accompanying tables, which also furnish a comparison with preceding years back to 1920.

The appended compilation was made from reports furnished to the *Railway Age* by the railroads, which were checked and amplified with information received from car builders, this latter being made available through the cooperation and assistance of the American Railway Car Institute.

The *Railway Age* has revised its figures for the years 1920-1944 to accord with the American Railway Car Institute's summary of orders and deliveries. Because of the early publication date of

Freight Cars Ordered, 1920-1945 (For Domestic Service)

Year	Railroad and Private Line Shops	Contract Shops	Total	U. S. Export
1945	12,023	27,016	39,039	10,024
1944	12,545	41,936	54,481	9,805
1943	11,487	25,543	37,030	44,646
1942	7,956	20,629	28,585	37,840
1941	27,389	79,508	106,897	10,474
1940	17,233	48,595	65,828	1,996
1939	14,527	39,388	53,915	1,510
1938	2,029	14,342	16,371	492
1937	15,231	34,711	49,942	1,321
1936	14,415	55,333	69,748	186
1935	8,061	10,688	18,749	403
1934	7,934	16,637	24,571	1,323
1933	741	979	1,720	167
1932	1,612	339	1,951	25
1931	5,831	4,366	10,197	150
1930	11,918	31,487	43,405	838
1929	12,903	97,238	110,141	2,610
1928	10,115	38,039	48,154	1,873
1927	12,380	60,611	72,991	118
1926	11,364	50,206	61,570	1,449
1925	8,946	77,639	86,585	1,497
1924	9,299	136,317	145,616	2,734
1923	11,111	84,498	95,609	780
1922	6,783	171,427	178,210	1,467
1921	894	23,871	22,767	4,123
1920	6,177	73,963	80,140	5,578

Source: 1945—Railway Age; all other—American Railway Car Institute.

Freight Cars Delivered, 1920-1945 (For Domestic Service)

Year	Railroad and Private Line Shops	Contract Shops	Total	U. S. Export
1945	12,726	31,815	44,541	10,564
1944	15,050	27,953	43,003	38,759
1943	7,220	24,622	31,842	43,117
1942	15,444	47,453	62,897	8,529
1941	17,227	63,396	80,623	2,386
1940	17,025	45,316	62,341	1,734
1939	5,641	19,491	25,132	381
1938	6,480	9,990	16,470	611
1937	15,569	61,929	77,498	1,321
1936	15,643	30,969	46,612	523
1935	1,550	5,965	7,515	1,263
1934	8,965	16,211	25,176	151
1933	1,300	863	2,163	151
1932	2,770	482	3,252	84
1931	7,497	7,497	13,203	410
1930	5,706	65,081	74,920	1,731
1929	9,839	68,712	81,590	3,448
1928	12,878	38,375	45,060	1,433
1927	7,685	38,375	46,060	467
1926	8,540	54,830	63,370	2,445
1925	9,964	78,898	88,862	3,077
1924	11,028	94,707	105,735	1,584
1923	9,618	104,093	113,711	1,966
1922	29,501	146,247	175,748	1,399
1921	2,423	63,866	66,289	5,351
1920	1,033	39,259	40,292	14,602
	14,171	46,784	60,955	

Source: 1945—Railway Age; all other—American Railway Car Institute.

Number and Classification of Freight Cars Ordered for Domestic Use

Year	Box	Flat	Stock	Gondola	Hopper	Tank	Refrig.	Others	Non-Rev.	Total
1945	16,106	1,240	...	6,075	13,348	640	1,000	136	394	39,039
1944	31,066	823	300	7,758	11,674	972	1,465	371	52	54,481
1943	10,027	2,212	...	5,312	18,400	556	50	153	320	37,030
1942	2,351	2,332	...	9,693	10,210	2,716	...	1,283	...	28,585
1941	55,939	3,459	400	15,814	23,213	2,800	2,370	1,614	1,288	106,897
1940	35,530	885	350	9,654	14,446	1,671	785	1,991	516	65,828
1939	20,140	976	100	6,419	21,923	2,373	675	1,127	182	53,915
1938	7,912	931	568	4,279	2,017	231	...	299	134	16,371
1937	20,564	1,365	500	10,120	12,817	692	1,770	287	1,827	49,942
1936	21,866	1,244	453	8,782	22,271	5,745	7,495	100	1,812	69,748
1935	8,925	75	50	2,755	5,970	313	600	32	29	18,749
1934	9,831	1,656	...	2,077	10,460	346	198	...	3	24,571
1933	619	50	...	4	33	269	615	129	1	1,720
1932	1,290	11	...	270	150	52	137	9	32	1,951
1931	2,100	400	750	1,072	3,113	261	2,314	28	159	10,197
1930	17,012	2,046	950	9,900	4,036	2,920	5,689	384	468	43,405
1929	57,139	3,888	2,950	18,289	16,117	4,446	3,583	789	2,940	110,141
1928	21,148	3,709	906	6,495	6,087	2,585	5,568	280	1,376	48,154
1927	28,975	2,694	1,668	13,735	11,835	5,930	4,432	1,067	2,655	72,991
1926	18,277	1,819	2,556	8,366	11,483	4,096	10,109	2,188	2,676	61,570
1925	40,668	2,720	2,749	21,869	6,448	4,701	5,308	802	1,320	86,585
1924	68,282	4,021	6,504	23,603	21,350	3,474	14,347	2,274	1,761	145,616
1923	35,286	2,904	714	16,318	23,883	6,003	6,207	2,448	1,846	95,609
1922	68,767	2,800	4,236	31,742	36,223	5,795	22,587	4,385	1,675	178,210
1921	5,130	292	630	5,427	4,708	327	4,905	1,048	298	22,765
1920	14,470	1,417	3,435	10,080	23,142	15,631	8,785	1,724	1,456	80,140

Source: 1945—Railway Age; all other—American Railway Car Institute.

the *Railway Age* compilation, orders placed late in December may be omitted and not reported by the railroads or builders in the succeeding year. The A. R. C. I., with the sources of informa-

tion at its disposal, is able to follow each car order through to delivery and to revise more completely its totals to eliminate duplicate reporting of orders and for subsequent cancellations. Another

reason for the difference in totals as reported by the Institute and the *Railway Age* has been variations in date of order as reported by the railroad and the builder.

Freight Cars Ordered — 1945

Railroad Orders—For Service in the United States

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Alaska	5	Caboose	.....	28 4½	Steel	47,000	March	December	Int. Ry. Car & Equip.
Alton	40	Caboose	.....	29 3	Steel	53,400	July	Feb. '46	Amer. Car & Fdy.
Atchison, Topeka & Santa Fe ...	250	Cov. Hopper	140,000	29 3	Steel	53,400	July	Feb.-Mar. '46	General American
.....	500*	Box	100,000	40 6	Steel	47,300	Dec. '44	Nov.-Dec.	Mt. Vernon
Atlantic Coast Line	2	Air Dump	40,000	..	Steel	.....	January	December	Austin-Western
Baltimore & Ohio	500	Hopper	100,000	33 0	Steel	42,000	August	Apr. '46	Ralston Steel Car
.....	500*	S. S. Box	100,000	50 6	Composite	54,000	Dec. '44	Aug.-Oct.	Greenville
.....	1,000	Hopper	100,000	33 0	Steel	40,000	August	Dec.-Apr. '46	Bethlehem Steel
.....	350	Cov. Hopper	140,000	26 3½	Steel	50,600	August	May '46	Amer. Car & Fdy.
.....	500	Hopper	100,000	33 0	Steel	40,100	August	Feb. '46	Pressed Steel
.....	25	Caboose	100,000	23 5½	Steel	40,400	August	October	Company Shops
Bangor & Aroostook	100*	Box	80,000	40 5	Steel	45,500	Dec. '44	December	Magor Car
.....	50	Hopper	100,000	40 8	Steel	50,000	April	December	Bethlehem Steel
Bessemer & Lake Erie	500	Hopper	140,000	..	Steel	.....	December	.....	Pullman-Standard
.....	250	Hopper	140,000	..	Steel	.....	December	.....	Pressed Steel
Chesapeake & Ohio	1,490	Hopper	100,000	33 0	Steel	41,000	August	July '46	Amer. Car & Fdy.
.....	10	Spl. Hopper	100,000	..	Steel	.....	August	Aug. '46	Amer. Car & Fdy.
.....	200	Cov. Hopper	140,000	29 3	Steel	52,000	September	Mar.-Apr. '46	General American
.....	500	Hopper	100,000	33 0	Steel	40,500	September	Apr.-May '46	General American
Chicago & Eastern Illinois	5*	Box	100,000	40 6	Steel	47,400	Dec. '44	October	Pullman-Standard
Chicago & North Western	800	Box	100,000	40 6	Steel	46,800	September	May-June '46	General American
.....	300	Flat	100,000	53 6	Steel	49,900	September	1946	Mt. Vernon
.....	400	Gondola	140,000	41 6	Steel	.....	September	June-July '46	Bethlehem Steel
.....	500	Box	100,000	50 6	Steel	.....	September	1946	Pullman-Standard
Chicago, Burlington & Quincy ..	255	Box	100,000	40 6	Steel	46,500	February	August	Company Shops
.....	350	Hopper	110,000	34 3	Steel	38,800	August	September	Company Shops
.....	100	Box	100,000	50 6	Steel	57,700	August	1946	Company Shops
.....	100	Cov. Hopper	140,000	29 3	Steel	51,900	August	1946	Company Shops
.....	500	Box	100,000	40 6	Steel	46,500	July	1946	Company Shops
.....	500	Auto	100,000	40 6	Steel	49,500	July	1946	Company Shops
(For Ft. Worth & Denver City)	25	Hopper	140,000	29 3	Steel	52,600	May	November	Company Shops
Chicago Great Western	150*	Box	100,000	40 6	Steel	47,400	Dec. '44	Sept.-Oct.	Pullman-Standard
.....	25	Caboose	.....	27 0	Steel	.....	April	Dec.-Jan. '46	Pullman-Standard
Chicago, Milwaukee, St. Paul & Pacific	1,000	Box	100,000	40 6	Steel	.....	January	June-Oct.	Company Shops
.....	500	Flat	100,000	52 6	Steel	.....	January	Nov.-Dec.	Company Shops
.....	35	Cov. Hopper	140,000	29 3	Steel	.....	January	Jan. '46	Company Shops
.....	65	Caboose	.....	35 3½	Steel	.....	May & June	Jan. '46	Company Shops
.....	1,200	Gondola	100,000	41 6	Steel	.....	Apr. & June	Jan.-June '46	Company Shops
Chicago, Rock Island & Pacific ..	500	D. S. Box	100,000	40 6	Steel	42,000	March	Jan.-Mar. '46	Pullman-Standard
.....	250	D. S. Auto	100,000	50 6	Steel	51,000	October	May '46	Amer. Car & Fdy.
Chicago, St. Paul, Minneapolis & Omaha	400	Gondola	140,000	41 6	Steel	.....	September	Apr.-May '46	Bethlehem Steel
Clinchfield	1,000	Hopper	100,000	33 0	Steel	39,800	March	Feb. '46	Amer. Car & Fdy.
.....	1,000	Hopper	100,000	33 0	Steel	39,800	July	Apr. '46	Amer. Car & Fdy.
.....	50	Flat	100,000	53 6	Steel	51,700	July	Apr. '46	Amer. Car & Fdy.
.....	20	Cov. Hopper	140,000	29 3	Steel	52,600	September	Apr. '46	Amer. Car & Fdy.
.....	300	Box	100,000	40 6	Steel	44,400	July	May '46	Mt. Vernon
Colorado & Wyoming	50	Gondola	140,000	46 0	Composite	55,000	January	Mar. '46	Mt. Vernon
Denver & Rio Grande Western ..	25	Cov. Hopper	140,000	29 3	Steel	53,400	August	Mar. '46	General American
.....	500*	Box	100,000	40 6	Steel	43,200	Dec. '44	Jan. '46	Pressed Steel
.....	200	S. Ballast	140,000	40 6	Steel	65,000	August	Mar. '46	Amer. Car & Fdy.
Detroit, Toledo & Ironton	200	Cov. Hopper	140,000	29 3	Steel	51,500	June	Jan. '46	Greenville
Donora Southern	50	Hopper	140,000	40 8	Steel	54,000	February	Dec. '46	Amer. Car & Fdy.
.....	40	Gondola	140,000	40 0	Steel	54,000	December	Apr. '46	Magor Car
Elgin, Joliet & Eastern	300	Gondola	100,000	..	Steel	.....	December	.....	Amer. Car & Fdy.
.....	200	Flat	100,000	..	Composite	.....	December	.....	Amer. Car & Fdy.
.....	100	Gov. Hopper	140,000	..	Steel	.....	December	.....	General American
Erie	700	Box	100,000	40 8½	Steel	46,000	June	Apr. '46	Amer. Car & Fdy.
.....	100	Cov. Hopper	140,000	29 3	Steel	53,500	July	Feb. '46	Greenville
.....	600	Gondola	140,000	52 6	Steel	62,000	July	Dec.-Feb. '46	Bethlehem Steel
.....	100	Caboose	80,000	24 1	Steel	43,800	January	Sept.-Nov. '46	Company Shops
Great Northern	500	Box	100,000	40 0	Steel	45,300	January	Feb. '46	Company Shops
.....	1	Caboose	.....	30 0	Steel	.....	August	Jan. '46	Company Shops
.....	3	Caboose	.....	30 0	Steel	.....	October	Jan. '46	Company Shops
Illinois Central	300	Auto	100,000	..	Steel	.....	August	.....	Company Shops
Illinois Terminal	50	Flat	100,000	53 6	Steel	51,700	January	Dec. '46	Amer. Car & Fdy.
.....	4	Caboose	.....	..	Steel	.....	March	Nov.-Dec.	Company Shops
Kansas City Southern	150	Hopper	140,000	40 8	Steel	49,000	March	Mar. '46	Pullman-Standard
.....	50	Cov. Hopper	140,000	46 2	Steel	59,000	March	Jan. '46	Pullman-Standard
Lehigh Valley	15	Caboose	.....	24 4½	Steel	44,000	April	Mar. '46	Company Shops
Louisville & Nashville	400	Box	100,000	40 6	Steel	46,500	July	Mar. '46	Amer. Car & Fdy.
.....	150	Auto	100,000	40 6	Steel	52,000	July	Apr. '46	Amer. Car & Fdy.
.....	50	Auto	100,000	50 6	Steel	56,300	July	Apr. '46	Amer. Car & Fdy.
.....	1,000	Hopper	100,000	33 0	Steel	.....	July	Jan.-June '46	Pullman-Standard
.....	400	Box	100,000	40 6	Steel	45,300	July	June '46	Mt. Vernon
Manufacturers	1	Caboose	60,000	19 5½	Steel	34,000	April	Apr. '46	Mt. Vernon
Minneapolis & St. Louis	75	Flat	100,000	53 6	Steel	42,400	1945	1946	Company Shops
.....	50	Cov. Hopper	140,000	29 3	Steel	52,500	November	1946	Pullman-Standard
Missouri Illinois	50	Box	100,000	40 8½	Steel	46,000	April	December	Amer. Car & Fdy.
Missouri-Kansas-Texas	50	Cov. Hopper	140,000	29 3	Steel	53,000	September	Mar. '46	Amer. Car & Fdy.
.....	235	Auto	80,000	40 6	Steel	49,800	February	Sept.-Dec.	Company Shops
.....	75	Auto	100,000	50 6	Steel	56,000	February	December	Company Shops
.....	150	Auto	80,000	40 6	Steel	49,800	August	Jan.-Feb. '46	Company Shops
.....	50	Auto	100,000	50 6	Steel	56,000	August	Mar. '46	Company Shops
Missouri Pacific	400	Box	100,000	40 6	Steel	.....	April	1946	Pullman-Standard
(For St. Louis Brownsville & Mexico)	50	Cov. Hopper	140,000	29 3	Steel	51,300	April	Feb. '46	Amer. Car & Fdy.
Monongahela Connecting	50	Gondola	140,000	..	Steel	.....	March	Aug.-Nov.	Pitt. Br. & Iron
Montour	1	Hopper	140,000	43 11½	Steel	37,000	June	December	Amer. Car & Fdy.
.....	200	Hopper	100,000	33 0	Steel	.....	September	Feb. '46	Pullman-Standard
Nashville, Chattanooga & St. Louis	2	Air Dump	60,000	26 9	Steel	50,000	September	June '46	Pressed Steel
New York Central	750	Hopper	140,000	29 3	Steel	52,000	August	June '46	Despatch Shops
(For Pittsburgh & Lake Erie)	1,000	H. S. Gondola	140,000	52 6	Steel	61,000	January	Feb. '46	Despatch Shops
New York, Chicago & St. Louis ..	500	D. S. Box	100,000	40 6	Steel	46,000	November	Apr. '46	Pullman-Standard
.....	50	D. B. Hopper	140,000	29 3	Steel	52,000	November	Apr. '46	Harlan & Holl'sworth
.....	50	D. B. Hopper	140,000	40 2½	Steel	61,000	November	Apr. '46	Harlan & Holl'sworth
Newburgh & South Shore	100	Gondola	140,000	40 0	Steel	54,000	December	Apr. '46	Magor Car
New York, New Haven & Hartford	500*	D. S. Box	100,000	40 6	Steel	44,900	Dec. '44	Oct.-Dec.	Pullman-Standard

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Norfolk & Western	250	D. S. Box	100,000	40 6	Steel	46,200	June	Mar.-Apr. '46	Company Shops
	100	Cov. Hopper	140,000	28 0	Steel	49,300	October	Apr.-May '46	Company Shops
Northern Pacific	500*	D. S. Box	100,000	40 6	Steel	41,600	Dec. '44	Aug.-Sept.	Pullman-Standard
	500*	D. S. Box	100,000	40 6	Steel	.....	Dec. '44	December	Amer. Car & Fdy.
Pennsylvania	10	D. S. Box	100,000	60 6	Steel	49,900	January	Jan. '46	Company Shops
	290	D. S. Box	100,000	50 6	Steel	47,000	January	December	Company Shops
	200	D. S. Box	100,000	50 6	Steel	48,000	January	Jan. '46	Company Shops
	300	Cov. Hopper	140,000	31 0	Steel	50,000	July	Mar. '46	Company Shops
Pere Marquette	200	Auto	100,000	50 6	Steel	62,000	August	May '46	Ralston Steel Car
	100	Cov. Hopper	140,000	29 3	Steel	53,500	August	Feb. '46	Greenville
Pittsburgh & West Virginia	10	Cov. Hopper	140,000	29 3	Steel	53,400	September	Apr. '46	General American
Reading	700	D. S. Box	100,000	40 6	Steel	46,500	July	Mar. '46	Company Shops
	300	D. S. Box	100,000	50 6	Steel	54,500	July	Mar. '46	Company Shops
	100	Cov. Hopper	140,000	27 4 3/4	Steel	52,850	November	Aug. '46	Company Shops
St. Louis-San Francisco	300	Auto	100,000	40 6	Steel	53,000	August	1946	Pullman-Standard
	200	Ballast	140,000	31 8	Steel	53,500	September	May '46	Amer. Car & Fdy.
	100	Cov. Hopper	140,000	29 3	Steel	52,900	September	1946	Company Shops
	20	Caboose	.....	29 2	Steel	45,100	September	1946	Company Shops
	10	Caboose	.....	29 2	Steel	45,100	February	December	Company Shops
St. Louis Southwestern	150	Auto	100,000	40 6	Steel	44,000	July	May '46	Mt. Vernon
	100	Auto	100,000	50 6	Steel	48,000	July	June '46	Mt. Vernon
	25	Cov. Hopper	140,000	39 10	Steel	55,500	April	Feb. '46	Amer. Car & Fdy.
	100	Gondola	100,000	40 0	Composite	49,400	March	Nov.-Dec.	Company Shops
	50	Flat	140,000	54 4	Steel	52,000	September	Jan. '46	Company Shops
Seaboard Air Line	50	Box	100,000	40 6	Steel	47,400	October	October	Pullman-Standard
	13	Air Dump	100,000	29 6	Steel	61,500	January	November	Magor Car
Southern	1,000	Auto	100,000	50 6	Steel	.....	November	Apr.-June '46	Pullman-Standard
Southern Pacific	600	S. S. Box	100,000	40 6	Steel	40,000	September	1946	Pullman-Standard
	150	Cov. Hopper	140,000	29 3	Steel	53,400	September	Feb. '46	General American
	750	Auto	100,000	50 6	Steel	53,400	September	July-Aug. '46	General American
	200	H. S. Gondola	100,000	41 8	Composite	43,000	September	June '46	Ralston Steel Car
	550	Gondola	100,000	41 0	Steel	52,000	September	Mar.-May '46	Bethlehem Steel
	250	Hopper	140,000	40 8	Steel	47,500	September	June '46	Amer. Car & Fdy.
	50	Caboose	.....	32 0	Steel	47,500	October	Mar.-Apr. '46	Amer. Car & Fdy.
	1,000	S. S. Box	100,000	40 6	Steel	40,500	September	Apr. '46	Pressed Steel
	500*	S. S. Box	100,000	40 6	Steel	40,000	Dec. '44	Jan.-Feb. '46	Mt. Vernon
Spokane, Portland & Seattle	500	Box	100,000	40 6	Steel	.....	May	Jan. '46	Pullman-Standard
	25	Ballast	140,000	40 8	Steel	55,000	January	Jan. '46	Amer. Car & Fdy.
Texas & Pacific	75	Cov. Hopper	140,000	39 10	Steel	55,500	April	Mar. '46	Amer. Car & Fdy.
Union	500	Gond. Bodies	100,000	.....	Steel	.....	June	.....	Company Shops
	500	Hopper	140,000	.....	Steel	.....	December	.....	Greenville
Union Pacific	500	Auto Box	100,000	50 6	Steel	.....	May	1946	Pullman-Standard
	1,000*	Box	100,000	50 6	Steel	.....	Dec. '44	1946	Mt. Vernon
Wabash	500	Gondola	100,000	41 6	Steel	43,900	April	Jan.-June '46	Company Shops
	20	Caboose	.....	29 3	Steel	.....	April	Nov.-Dec.	Company Shops
Western Maryland	40	Cov. Hopper	140,000	29 3	Steel	53,300	July	Feb. '46	Amer. Car & Fdy.
	300	S. S. Box	100,000	40 6	Composite	.....	August	Mar.-May '46	Bethlehem Steel
Western Pacific	10	Caboose	80,000	34 9 1/2	Steel	48,000	January	August	Company Shops
Wheeling & Lake Erie	6	Cov. Hopper	140,000	29 3	Steel	52,000	October	Apr. '46	General American

* Not listed last year.

Private Car Line and Other Orders—For Service in the United States

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
American Agricultural Chemical Co.	3*	Tank	10,000 g.	32 10 3/4	Steel	44,500	Dec. '44	August	General American
American Cyanamid Co.	1	Tank	7,800 g.	32 10 3/4	Steel	44,500	August	Jan. '46	Amer. Car & Fdy.
American Refrigerator Transit	50	Refrigerator	.....	.....	Composite	.....	July	.....	Company Shops
American Steel Foundries	1	Exp. Box	.....	.....	Steel	.....	September	.....	Pullman-Standard
American Rolling Mill Co.	15	Gondola	140,000	.....	Steel	.....	February	September	Pullman-Standard
Ansul Chemical Co.	2	Air Dump	100,000	29 6	Steel	61,500	March	November	Magor Car
Atlantic Steel Co.	1	Tank	60,000	.....	Steel	.....	January	September	General American
Budlong Pickle Co.	2	Air Dump	180,000	.....	Steel	.....	June	Apr. '46	Austin-Western
Carnegie-Illinois Steel Co.	1	Pickle Tank	100,000	.....	Steel	.....	1945	November	Haffner-Thrall
Carnegie-Illinois Steel Co.	10	Flat	100,000	25 0	Steel	46,000	April	November	Amer. Car & Fdy.
Consolidated Chemical Industries, Inc.	3	Flat	140,000	.....	Steel	.....	1945	November	Haffner-Thrall
Cook Paint & Varnish Co.	5	Tank	10,000 g.	.....	Steel	.....	October	Mar. '46	General American
Copperwell Steel Co.	1	Tank	4,000 g.	25 2 3/4	Steel	38,300	March	December	Amer. Car & Fdy.
Cudahy Packing Co.	6	Air Dump	100,000	29 6	Steel	61,500	October	Mar. '46	Magor Car
Diamond Alkali Co.	150	Refrigerator	80,000	30 5 1/2	Composite	59,500	May	Apr. '46	Amer. Car & Fdy.
Diamond Alkali Co.	5	M. U. Tank	80,000	42 3 3/4	Steel	33,500	November	Dec. '46	Amer. Car & Fdy.
Dow Chemical Co., Great Western Division	8	Tank	60,000	.....	Steel	.....	November	Mar. '46	General American
Dow Chemical Co., Great Western Division	8*	Tank	8,000 g.	.....	Steel	.....	Dec. '44	Aug.-Nov.	General American
Dow Chemical Co., Great Western Division	8*	Tank	10,000 g.	.....	Steel	.....	Dec. '44	October	General American
Texas Division	10	Tank	10,000	.....	Steel	.....	May	Feb. '46	General American
Texas Division	10	Tank	10,000	.....	Steel	.....	October	Mar. '46	General American
Du Pont de Nemours, E. I. & Co.	5	Tank	6,000 g.	.....	Steel	.....	January	May-June	General American
Ethyl-Dow Chemical Co.	5	Tank	8,000 g.	.....	Steel	.....	June	Jan. '46	General American
Ford Motor Co.	50	Gondola	140,000	34 8	Steel	54,600	June	Jan. '46	Greenville
Fruit Growers' Express	125	Refrigerator	80,000	39 10 3/4	Steel	58,700	February	Feb.-Mar. '46	Mt. Vernon
Fuelane Corp.	6	Tank	11,000 g.	38 10 3/4	Steel	67,340	January	August	Amer. Car & Fdy.
Fuelane Corp.	1	Tank	11,000 g.	38 10 3/4	Steel	69,200	February	October	Amer. Car & Fdy.
General Electric Co.	10	Cov. Hopper	140,000	29 3	Steel	52,600	November	Apr. '46	Amer. Car & Fdy.
Great Bear Spring Co.	1	Tank	8,000	33 0 3/8	Steel	32,700	November	Feb. '46	Amer. Car & Fdy.
Halliburton Oil Well Cementing Co.	50	Cov. Hopper	140,000	29 3	Steel	53,400	February	Jan. '46	General American
Hirsch Bros. & Co.	1*	Pickle Tank	100,000	.....	Steel	.....	Nov. '44	August	Haffner-Thrall
Hirsch Bros. & Co.	1	Pickle Tank	100,000	.....	Steel	.....	1945	.....	Haffner-Thrall
Home Gas Corp.	1	Tank	11,000 g.	38 10 3/4	Steel	68,100	February	October	Amer. Car & Fdy.
Lehigh Gas, Inc.	1	Tank	11,000 g.	38 10 3/4	Steel	68,000	January	September	Amer. Car & Fdy.
Linde Air Products Co.	25	Box	140,000	40 8	Steel	49,500	January	April	Amer. Car & Fdy.
Linde Air Products Co.	15	Box	140,000	40 8	Steel	49,500	May	Jan. '46	Amer. Car & Fdy.
Lone Star Producing Co.	5	Tank	10,500 g.	37 0	Steel	68,000	October	Jan. '46	Amer. Car & Fdy.
Midland Electric Coal Co.	10	Hopper	100,000	37 3 1/2	Steel	52,600	April	Feb. '46	Pressed Steel
Missouri Portland Cement	10	Cov. Hopper	140,000	29 3	Steel	52,600	September	Mar. '46	Amer. Car & Fdy.
Monsanto Chemical Co.	2*	Tank	8,000 g.	.....	Steel	.....	Dec. '44	October	General American
Monsanto Chemical Co.	1	Tank	7,000 g.	29 7 1/2	Steel	41,500	February	December	Amer. Car & Fdy.
Monsanto Chemical Co.	1	Tank	8,000 g.	33 2 3/8	Steel	47,300	March	December	Amer. Car & Fdy.
Monsanto Chemical Co.	1	Tank	6,000 g.	29 11 1/2	Steel	38,900	May	December	Amer. Car & Fdy.
Northern Refrigerator Line	500	Refrigerator	70,000	33 2	Steel	.....	September	Mar.-Apr. '46	Despatch Shops
Oliver Iron Mining Co.	50	Air Dump	150,000	.....	Steel	.....	May	Jan.-Mar. '46	Austin-Western
Penna. Salt Mfg. Co.	1	Tank	4,000 g.	24 8 3/8	Aluminum	30,300	August	Feb. '46	Amer. Car & Fdy.
Pittsburgh Steel Co.	5	Bloom	140,000	35 11 1/2	Steel	77,300	March	Jan. '46	Pressed Steel
Republic Steel Corp.	2	Tank	12,500 g.	.....	Steel	.....	August	Feb. '46	General American
Robeson Process	1	Tank	.....	.....	Steel	.....	October	November	Amer. Car & Fdy.
John A. Roebling's Sons Co.	20	L. S. Gondola	100,000	38 3	Steel	50,000	October	Feb. '46	Amer. Car & Fdy.
Shell Chemical Co.	3	Tank	6,000 g.	33 2 3/8	Steel	40,500	October	Mar. '46	Amer. Car & Fdy.
Shell Union Oil Co.	3	Tank	6,000 g.	.....	Steel	.....	October	Mar. '46	General American
Shippers' Car Line Corp.	175	Cov. Hopper	140,000	29 3	Steel	52,600	1945	1946	Amer. Car & Fdy.
Shippers' Car Line Corp.	15	House	100,000	40 1 1/2	Steel	67,200	March	Feb. '46	Amer. Car & Fdy.
Shippers' Car Line Corp.	91	Tank	.....	.....	Steel	.....	1945	1945	Amer. Car & Fdy.
Shippers' Car Line Corp.	61	Tank	.....	.....	Steel	.....	1945	1946	Amer. Car & Fdy.

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Solvay Process Co.	2	Tank	8,000 g.	...	Steel	.....	April	Jan. '46	General American
.....	3	Tank	10,000 g.	...	Steel	.....	April	Jan. '46	General American
.....	4	Cov. Hopper	140,000	29 3	Steel	49,000	May	Mar. '46	Amer. Car & Fdy.
Speno, Frank, Sr.	2	Ball. Cleaner	100,000	70 8	Steel	150,000	January	Dec. '46	Amer. Car & Fdy.
Stauffer Chemical Co.	1	Tank	7,000 g.	...	Steel	.....	January	April	General American
Sturm & Dillard Co.	5	Air Dump	100,000	...	Steel	.....	February	Dec.-Jan. '46	Austin-Western
Sunlight Coal Co.	6	Air Dump	140,000	...	Steel	.....	July	Apr. '46	Austin-Western
Tennessee Coal, Iron & R. R. Co.	17	Air Dump	140,000	42 0	Steel	84,000	July	Feb. '46	Pressed Steel
.....	3	Air Dump	140,000	42 0	Steel	84,000	October	Feb. '46	Pressed Steel
Tennessee Eastman Corp.	2	Tank	8,000 g.	33 6	Aluminum	35,500	July	Jan. '46	Amer. Car & Fdy.
Tennessee Products Corp.	1	Tank	8,000 g.	...	Steel	.....	November	Mar. '46	General American
Timken Roller Bearing	2	Air Dump	140,000	...	Steel	.....	June	Mar. '46	Austin-Western
Union Carbide & Carbon Corp. .	2	Hopper	100,000	33 0	Steel	41,000	February	November	Amer. Car & Fdy.
U. S. Navy	200	Box	100,000	...	Steel	.....	February	August	Pressed Steel
U. S. War Dept.	361	Tank	7,500 g.	31 3½	Steel	45,700	January	July	Amer. Car & Fdy.
.....	4	Tank	100,000	...	Steel	.....	March	September	General American
Warren Petroleum Corp.	20	Tank	10,500 g.	...	Steel	68,000	January	Aug.-Sept.	General American
.....	15	Tank	10,500	37 0	Steel	67,220	January	October	Amer. Car & Fdy.
Western Fruit Express	175	Refrigerator	80,000	39 10½	Steel	59,300	February	Mar. '46	Mt. Vernon
Wheeling Steel Corp.	2	Flat	140,000	50 0	Steel	58,300	July	Feb. '46	Pressed Steel
.....	2	Cinder Pot	200,000	38 4	Steel	74,000	October	June '46	Pressed Steel

* Not listed last year.

United States—Export

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
American Sugar Refining Co. ...	50	Cane	60,000	11 4	Steel	31,700	November	Aug. '46	Magor Car
Butane, Ltd.	1	Tank	10,500 g.	...	Steel	.....	July	Feb. '46	General American
Canadian Industries, Ltd.	1	M. U. Tank	80,000	42 3¾	Steel	33,500	April	August	Amer. Car & Fdy.
Canadian National	500*	S. S. Box	80,000	50 6	Steel	51,700	Dec. '44	December	Pressed Steel
Chilean Nitrate Sales Corp.	100	Ore	60,000	22 9	Steel	39,200	June	Apr. '46	Pressed Steel
Chilean State Rys.	730	Box	66,000	32 9¾	Steel	34,670	January	Apr.-May '46	Magor Car
.....	250	Box	66,000	33 11½	Steel	29,860	January	May '46	Magor Car
.....	20	Refrigerator	100,000	35 8	Composite	59,500	November	May '46	Amer. Car & Fdy.
Consolidated Railroads of Cuba .	250	Box	100,000	40 6	Steel	46,000	April	Apr. '46	Mt. Vernon
Departamento Nacional de Estradas de Ferro, Brazil	50	Stock	66,000	39 1¾	Composite	29,500	November	June '46	Pressed Steel
.....	250*	Box	66,000	39 2¾	Composite	30,000	Nov. '44	May '46	Pressed Steel
.....	300	Flat	66,000	36 1	Composite	24,400	July	May '46	Pressed Steel
Distribuidora de Gas Menguc, S.A.	2*	Tank	10,000 g.	...	Steel	.....	Dec. '44	Feb. '46	General American
N. Ellinger, Peru	100	Cane	35,000	...	.....	.....	January	1945-6	Pressed Steel
Estufas y Refrigeradores, S.A.	2	Tank	10,000 g.	...	Steel	.....	June	Feb. '46	General American
Fabrica Nacional de Acidos, Mexico	15	Tank	100,000	29 3¾	Steel	42,400	June	December	Amer. Car & Fdy.
Cia Industrial Azucarrera	30	Cane	30,000	...	.....	.....	January	1946	Pressed Steel
Intl. General Electric Co.	15	Flat	100,000	50 0	Steel	52,800	February	December	Amer. Car & Fdy.
Leopoldian Ry., Brazil	200	Box	66,000	34 0	Steel	24,600	June	June '46	Pressed Steel
Mecke & Co. (F. C. deAntioquia, Colombia)	6	Tank	60,000	30 7¾	Steel	32,000	July	December	Amer. Car & Fdy.
Ministry of Public Works, Venezuela	8	Flat	26,400	23 0	Composite	11,500	May	May '46	Pressed Steel
.....	8	Gondola	26,400	22 9½	Composite	13,480	May	May '46	Pressed Steel
Mogiana Ry., Brazil	150	S. S. Box	79,000	40 6	Steel	29,100	June	Mar. '46	Pressed Steel
National Rys. of Mexico	1,500	Box	100,000	40 6	Composite	47,500	March	May	Amer. Car & Fdy.
.....	50	Exp. Box	100,000	40 6	Steel	59,000	June	Feb. '46	Magor Car
National Steel Co., Brazil	200	Gen. Serv.	140,000	44 3	Steel	.....	May	1946	Pullman-Standard
.....	50	Ore	150,000	21 7	Steel	.....	July	1946	Pullman-Standard
Netherlands Purchasing Commis- sion	120	Flat	53,000	32 0	Steel	25,600	February	.....	Amer. Car & Fdy.
Newfoundland Co.	10	Air Dump	60,000	25 3	Steel	39,650	November	June '46	Magor Car
Pacific International Corp., Chile	10	Tank	100,000	35 6¾	Steel	50,000	August	Jan. '46	Amer. Car & Fdy.
Paulista Ry., Brazil	250	Gondola	92,400	50 6	Steel	41,200	June	Jan. '46	Amer. Car & Fdy.
.....	250	Flat	92,400	50 6	Steel	38,000	June	Feb. '46	Amer. Car & Fdy.
.....	500	Box	84,000	50 6	Steel	.....	June	1946	Pullman-Standard
Corp. Peruana Del Santa	25	Hopper	80,000	31 0	Aluminum	23,000	April	Apr. '46	Mt. Vernon
Peruvian Corp., Ltd.	24	Flat	66,000	40 0	Steel	22,500	February	Mar. '46	Pressed Steel
Petroleos Mexicanos	27	Tank	60,000	29 1½	Steel	33,700	August	Jan. '46	Amer. Car & Fdy.
Sau Paulo Ry., Brazil	100	Gondola	84,000	36 9	Steel	.....	July	1946	Pullman-Standard
Sorocabana Ry., Brazil	20	Tank	7,000 g.	33 3¾	Steel	37,300	November	Feb. '46	Amer. Car & Fdy.
Southland Lumber & Tdg.	6	Tank	60,000	...	Steel	.....	July	Jan. '46	General American
Standard Oil Co. of N. J.	27	Tank	.....	...	Steel	.....	June	Jan. '46	Amer. Car & Fdy.
(For Puerto Rico)	6	Tank	60,000	28 7½	Steel	28,700	September	Mar. '46	General American
(For Costa Rica)	1	Tank	60,000	...	Steel	.....	January	October	Amer. Car & Fdy.
Temperleys, Haslehurst & Co., Costa Rica	100*	Flat	40,000	31 1	Composite	19,270	Sept. '44	October	Magor Car
.....	20*	Box	40,000	29 4½	Steel	25,400	Oct. '44	December	Magor Car
Texas Company	53	Tank	60,000	...	Steel	.....	November	Apr. '46	General American
(For Costa Rica)	1	Tank	6,000 g.	28 10½	Steel	34,600	February	December	Amer. Car & Fdy.
Thermo Gas de Mexico	2	Tank	6,000 g.	30 1½	Steel	39,100	February	December	Amer. Car & Fdy.
Tropical Oil Co.	13	Tank	10,500 g.	37 0	Steel	66,500	April	December	Amer. Car & Fdy.
.....	6	Tank	6,000 g.	29 1½	Steel	32,700	April	December	Amer. Car & Fdy.
Usina Cinco Rios, Brazil	20	Cane	30,000	...	.....	.....	October	Mar. '46	Amer. Car & Fdy.
United Fruit Co.	45	Flat	25,000	32 0	Steel	14,305	January	1946	Pressed Steel
.....	60	Flat	25,000	32 0	Steel	14,300	January	Jan. '46	Magor Car
.....	100	Banana	24,000	35 9	Steel	23,670	July	Jan. '46	Magor Car
.....	40	Flat	25,000	32 0	Steel	.....	September	Feb. '46	Magor Car
.....	8	Tank	80,000	...	Steel	.....	January	Oct.-Dec.	Pullman-Standard
.....	3	Tank	60,000	...	Steel	.....	November	Mar. '46	General American
U. N. R. R. A.	1,470	Gondola	80,000	...	.....	.....	November	Mar. '46	General American
U. S. Navy—Bureau of Yards & Docks (by Raymond Concrete Pile Co.)	75	Flat	100,000	38 7½	Composite	36,200	January	March	Amer. Car & Fdy.
U. S. War Dept.	180	Tank	100,000	37 1½	Steel	43,400	February	August	Amer. Car & Fdy.
.....	700	Gondola	80,000	40 6½	Composite	26,200	May	June '46	Amer. Car & Fdy.
.....	300	Flat	100,000	41 3¼	Composite	47,000	February	August	Amer. Car & Fdy.
.....	800	L. S. Gondola	80,000	40 6½	Composite	30,000	May	Feb. '46	Ralston Steel Car
.....	50	Flat	100,000	...	Composite	.....	February	July-Aug.	Pullman-Standard
U. S. Treasury Dept.	335	Flat	100,000	40 9	Composite	33,000	January	April	Amer. Car & Fdy.
Victoria & Minas, Brazil	100	Flat	60,000	42 2½	Steel	.....	April	1946	Pullman-Standard
.....	200	Flat	60,000	39 2	Steel	.....	April	1946	Pullman-Standard

* Not listed last year.

Canada

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Algoma Steel Corp.	20	Gondola	100,000	36 0	Steel	.....	July	.....	National Steel
Canadian Export for Belgium ...	1,200	Gondola	55,000	26 2½	Steel	25,000	August	July '46	Eastern Car
Canadian Export Board	2,100	Gondola	50,000	26 3	Steel	.....	October	.....	National Steel

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Canadian Gov't.—Dept. of Munitions & Supplies (for Belgium)	900	Flat	55,000	40 7	Composite	.....	October	1946	Can. Car & Fdy.
	1,800	Box	44,000	26 11¼	Composite	.....	October	1946	Can. Car & Fdy.
Canadian National	500	S. S. Box	100,000	40 6	Steel	44,600	March	December	Eastern Car
	500	S. S. Box	100,000	40 6	Steel	44,600	August	March '46	Eastern Car
Canadian Pacific	200	Refrigerator	100,000	40 0	Steel	.....	April	.....	National Steel
	75	Air Dump	140,000	29 6	Steel	.....	June	1946	National Steel
	50	Air Dump	140,000	29 6	Steel	.....	October	1946	National Steel
	250	Refrigerator	100,000	40 0	Steel	.....	November	1946	National Steel
	500	S. S. Auto	100,000	40 6	Steel	.....	November	1946	National Steel
	50	Box	100,000	40 6	Steel	47,000	October	1946	Eastern Car
	950	Box	100,000	40 6	Steel	.....	November	1946	Can. Car & Fdy.
	50	Caboose	.....	28 4	Steel	.....	February	December	Company Shops
For Export*	1,500	Bogies	84,000	37 0	Steel	43,000	November	1946	Can. Car & Fdy.
	25	Flat	60,000	40 0	Steel	.....	November	1946	Can. Car & Fdy.
	60	Bogies	99,000	46 7	Steel	.....	November	1946	Can. Car & Fdy.
Newfoundland Ry.	25	Refrigerator	50,000	29 5½	Composite	45,600	January	June	Can. Car & Fdy.
Temiskaming & Northern Ontario	600	Box	100,000	40 6	Steel	.....	November	.....	National Steel
	75	Hopper	140,000	40 8	Steel	.....	November	.....	National Steel

* Reported by builder with purchaser not specified.

Passenger Cars

(Continued from page 93)

Canadian National ordered 15 cars to be built in Canada.

Deliveries of new cars to the railroads began in September and about 20 were completed by the year's end. The remaining 836 delivered were troop sleepers and kitchen cars for the War Department.

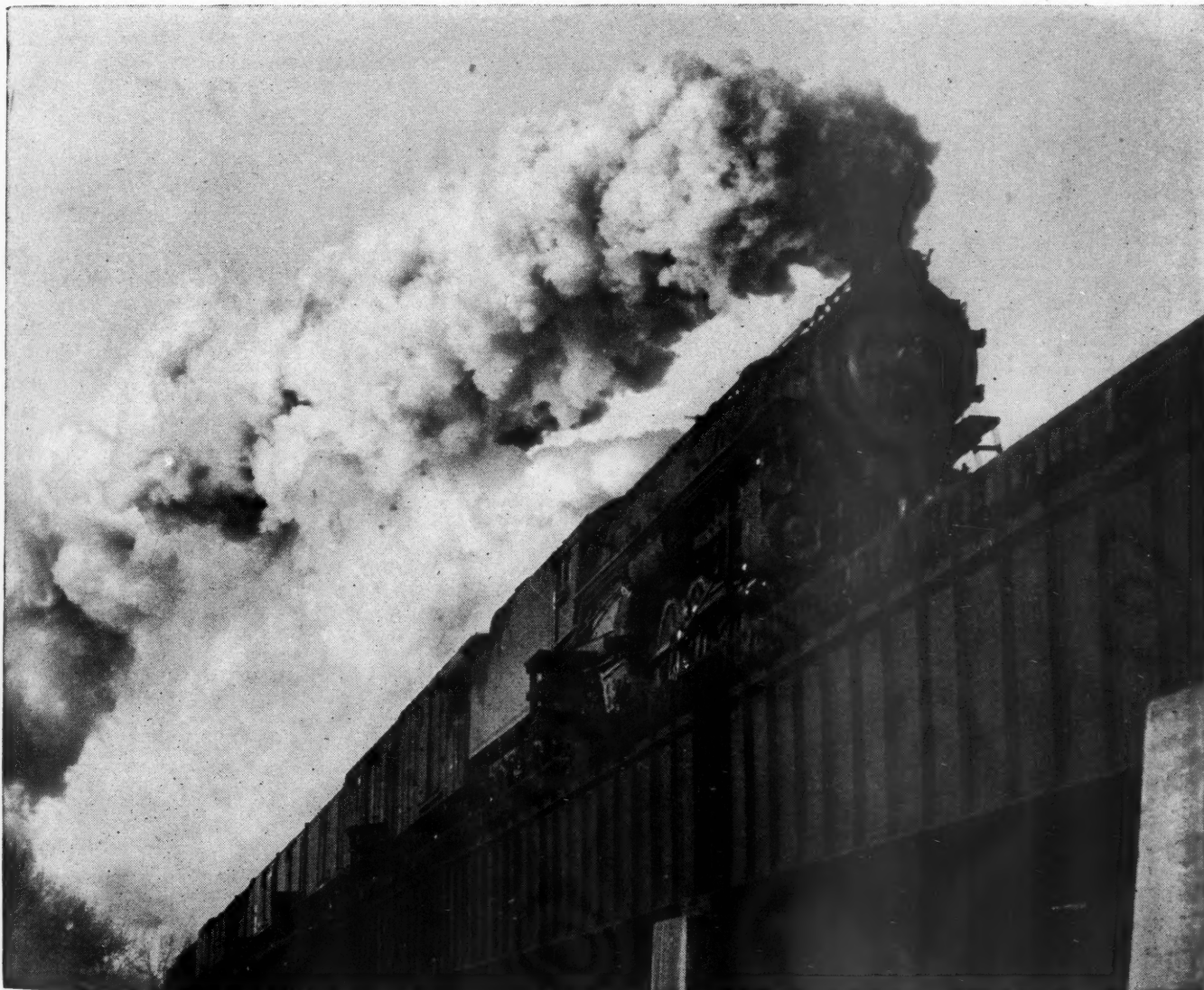
The cars ordered last year are listed in detail in the appended table and a

summary and analysis of the orders and deliveries is presented in the accompanying tables, which also furnish a comparison with preceding years back to 1920. An article in the annual Passenger Progress issue of the *Railway Age* (November 17, 1945) outlined how most of the cars currently on order are going to be used by the railroads and in what trains. The appended compilation was made from reports furnished to the *Railway Age* by the railroads, which were checked and amplified with information

received from the car builders, this latter being made available through the courtesy of the American Railway Car Institute.

The *Railway Age* has revised its figures for the years 1920-1944 to accord with the American Railway Car Institute's summaries of orders and deliveries. The A. R. C. I., with the sources of information at its disposal, is able to follow each car order through to delivery and accurately to revise its totals to eliminate duplicate reporting.

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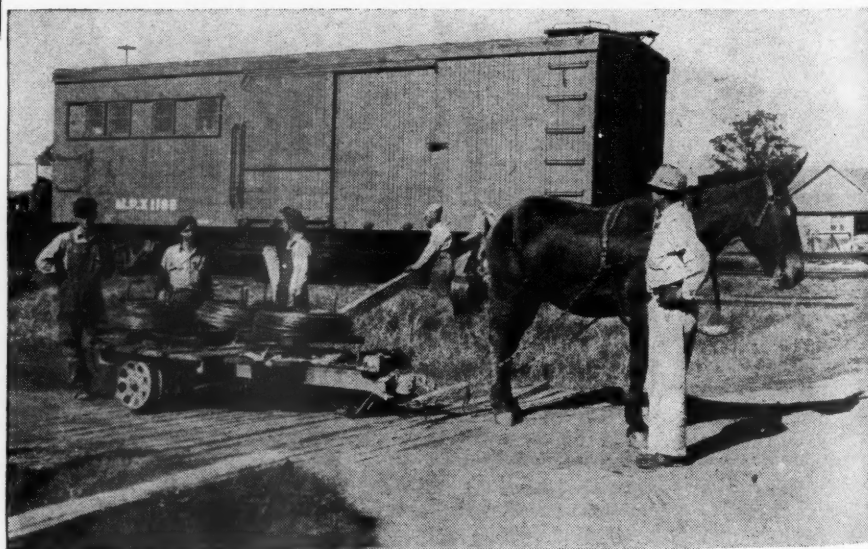
During 1945 a total of 2,242 light signals were installed on automatic block signaling projects—View shows searchlight signal unit being placed in service

Signal Construction Increased During 1945

By **MAURICE PEACOCK**
Associate Editor

CONSTRUCTION of signaling in the United States and Canada was substantially greater in 1945 than any previous year since 1931. A total of 10,394 units was installed last year, as compared with 7,646 units in 1944, and 11,349 units in 1931. The total figure for 1945 represents an increase of 2,748 units over that for 1944. Construction of automatic block signals, interlockings, spring switches, centralized traffic control and highway crossing protection increased in 1945 over the previous year,

Mule-drawn line wire payout reel facilitated the construction of new signal pole lines on construction projects



The year 1945 witnessed a substantial increase in the construction of systems of railroad signaling, especially centralized traffic control and automatically controlled highway - railroad grade crossing protection, as well as continued activity in construction of new types of interlocking. There was a reduction in the number of car retarders installed in freight classification yards.

but a reduction was shown in the number of car retarders installed in classification yards.

Automatic Block Signaling

Last year a total of 2,350 automatic block signals were installed, as compared with 1,539 in the previous year, representing an increase of 811 units. The 1945 figure is larger than that for any previous year since 1931, at which time 3,501 units were installed. Last year new automatic block signaling was placed in service on 2,193 miles of track, of which 1,416 miles was single track; 360 miles double track; 3 miles three track; and 12 miles four track. These figures represent a total of 1,791 miles of road.

The table indicates that there were 101 projects by 37 railroads, the largest installation of automatic block being on the Seaboard, covering 258 miles of single track between Waxhaw, N. C., and Atlanta, Ga. Other sizable installations were made on the Missouri Pacific; Chicago, Rock Island & Pacific; Louisville & Nashville; Canadian Pacific; and Central of Georgia. The Missouri Pacific installed automatic block on 150 miles of single track between Van Buren, Ark., and North Little Rock, while 145 miles was installed by the Rock Island on single track between Albright, Neb., and Belleville, Kan. The Louisville & Nashville installed automatic block on 107 miles of single track between Lebanon Jct., Ky., and Sinks, as part of a C. T. C. installation. The Canadian Pacific made an installation on 98 miles of single track between Lobo, Ont., and Walkerville Jct. Automatic block was also installed on 92 miles of single track by the Central of Georgia between Columbus, Ga., and Trammells, Ala.

Further Installations

The Boston & Maine installed automatic block on 20 miles of double track between North Berwick, Me., and Bid-

New Automatic Block Signaling Placed in Service During 1945

Railroad	Location	Miles of Road	Number of Signals	Manufacturer
A. T. & S. F.	Ellinor, Kan.-Bazar	8.0s	6s	Union
	Jacques, Kan.-Chelsea	12.0s	8s	Union
	Augusta, Kan.-East Jct.	12.0s	3c	Union
	Pauls Valley, Okla.-Purcell	18.9s	35c	Union
	Joffre, N. M.-Vaughn	14.4d	10s	Union
B. & M.	Brightwood, Mass.-Springfield	1.4d	2c	G.R.S.
	Crescent, N. Y.-Rotterdam Jct.	10.7d	14c	G.R.S.
	Johnsonville, N. Y.-Troy	14.2d	19c	G.R.S.
	Everett, Mass.-Saugas River	4.8d	8c	G.R.S.
	Swanescott, Mass.-Salem	1.3d	3c	G.R.S.
	Beverly, Mass.-Newburyport	16.7d	20c	G.R.S.
	Salisbury, Mass.-Emery, N. H.	13.3s	12c	G.R.S.
	Winchendon, Mass.	3.3s	4c	G.R.S.
	North Berwick, Me.-Biddeford	20.2d	30c	Union
	Lawrence, Mass.-M.&L. Branch	0.4s	1c	G.R.S.
	Lawrence, Mass.			
	Switching Signals (Non-automatic)		2c	G.R.S.
	Station Signals at 6 locations		8c	
	Rittenour, Ohio.-West Jct.	3.8s	4c	G.R.S.
B. & O.	Viaduct Jct., Md.-Mt. Savage Jct.	3.0t	2c	G.R.S.
	Crawford, Neb.-Belmont	17.0s	16c	G.R.S.
C. B. & Q.	Columbus, Ga.-Trammells, Ala.	92.2s	125c	Union
C. of G.	Beloit, Ill.-Beloit, Wis.	1.7s	5c	Union
C. M. St. P. & P.	Milwaukee, Wis.-Elm Grove	5.6s	5c	Union
	State Line, Ill.-Kenosha, Wis.	6.3d	9c	Union
C. N. S. & M.	Ryan Tower, Wis.-Milwaukee	0.6s	15c	Union
		8.4d		
C. & O.	Big Sandy Jct., Ky.-Kavan	12.0d	8c	Union
	Chapman, Ky.-Ray	14.0d	10c	Union
	Ashland, Ky.-Hitchins	28.0s	59c	Union
	Cheviot, Ohio.-Dent	7.0s	21c	Union
C. P.	Fort William, Ont.-Finmark	32.8d	17c	G.R.S.
	Fort Arthur, Ont.	2.8d	2c	G.R.S.
	Kennay, Man.	3.3d	2c	Union
	Birtle, Man.	5.3s	4c	Union
	Millwood, Man.	5.9s	4c	Union
	Red Deer, Alta.-Forth	3.9s	4c	Union
	Burmis, Alta.-Crownsnest	24.0s	39c	G.R.S.
	Ashcroft, B. C.	6.3s	4c	Union
	Lobo, Ont.-Walkerville Jct.	97.5s	162c	Union
	Nikigon, Ont.	3.9s	4c	Union
	Farnham, Que.	0.9d	4c	G.R.S.
	North Bay, Ont.	4.8s	6c	Union
	Albright, Neb.-Belleville, Kan.	144.6s	139c	Union
	Hallstead, Pa.-E. Binghamton, N. Y.	8.6d	9c	Union
D. L. & W.	Winter Park, Colo.-Orestod	25.3s	23c	Union
	Part of C.T.C. Installation			
E. J. & E.	Spaulding, Ill.	1.0s	2c	G.R.S.
	Chicago Heights, Ill.-Dyer	3.4s	2c	G.R.S.
Erie	Greenwood Lake Jct., N. J.-Forest Hill	4.1s	1c	Union
	Cold Springs, Ohio.-Dayton	18.3d	7s	Union
F. E. C.	Fort Pierce, Fla.		2c	G.R.S.
	Signals added to shorten existing blocks			
K. C. S.	Gulfton, Mo.-McElhany	33.5s	48c	G.R.S.
L. & H. R.	Belvidere, N. J.-Peguest	5.9s	16c	G.R.S.
L. & N.	Lebanon Jct., Ky.-Sinks	107.0s	136c	Union
	Part of C.T.C. Installation			
M-K-T	Birmingham, Ala.	0.6s	1c	G.R.S.
	Durant, Okla.-Armstrong	4.3s	2c	Union
M. P.	Denison, Tex.-Pottsboro	4.1s	2s	Union
	Van Buren, Ark.-N. Little Rock	150.0s	169c	G.R.S.
I-G. N.	San Antonio, Tex.-San Marcos	49.6s	69c	G.R.S.
	Camp Mabry, Tex.-Taylor	30.6s	43c	G.R.S.
G. C. L.	DeQuincy, La.	1.5s	2c	G.R.S.
	Easton, Wash.-Martin	8.5d	1c	G.R.S.
N. P.	Replacement of old signaling		25s	
	Stampede, Wash.-Lester	10.7d	1c	G.R.S.
	Replacement of old signaling		29s	
	Resignaling for both directions on both tracks			
N. Y. C.	Tivoli, N. Y.-Hudson	2.0f	24c	G.R.S.
	Semaphores replaced with light signals	11.0d		
B. & A.	West Fallen, Mass.-Palmer	11.1d	14c	G.R.S.
C. C. C. & St. L.	Gridley, Ind.-Taft	5.2s	10c	G.R.S.
			2s	
M. C.	Galion, Ind.-Edison	13.0s	14c	G.R.S.
	Kalamazoo, Mich.-Niles	43.0d	75c	G.R.S.
P. & L. E.	Semaphores replaced with light signals			
	West Detroit, Mich.-Wayne	14.0d	24c	G.R.S.
N. Y. C. & St. L.	Semaphores replaced with light signals			
	Monaca, Pa.-Josephstown	2.2s	2c	Union
N. Y. C. & St. L.	Townwood, Ohio.-Leipsic Jct.	4.8s	2c	Union
	Greenwich, Conn.-Rye, N. Y.	10.0f	30c	Union
N. Y., N. H. & H.	Norwood Central, Mass.-Readville	5.2d	4c	G.R.S.
	Framingham, Mass.-Framingham Ctr.	2.0d	4c	G.R.S.
P. E.	Whittenton Jct., Mass.-Cotley Jct.	4.0d	18c	Union
	Watts, Cal.-Long Beach	10.0d	38c	Union
Penna.	Replacement of old signals			
	Dominguez, Cal.-San Pedro	9.0d	46c	Union
Penna.	Replacement of old signals			
	Newark, Del.-North East, Md.	12.5s	10p	Union
Penna.	Reverse signals added			
	Shocks Mills, Pa.-Royalton	11.6d	6p	Union
Penna.	Tyrone, Pa.-Lock Haven	44.7s	27p	Union
	Part of C.T.C. installation	5.0d		
Penna.	Lucas, Ohio.-Toledo Jct.	13.3s	8p	Union
	Arrville, Ohio.-Smithville	5.5s	2p	Union
Penna.	Gem, Ind.-Riley	10.0s	—p	Union
	Crestline, Ohio.-Bucyrus	9.0s	—p	Union

Legend:

In "Miles of Road" column: s = single track; d = double track; t = three track; f = four track.

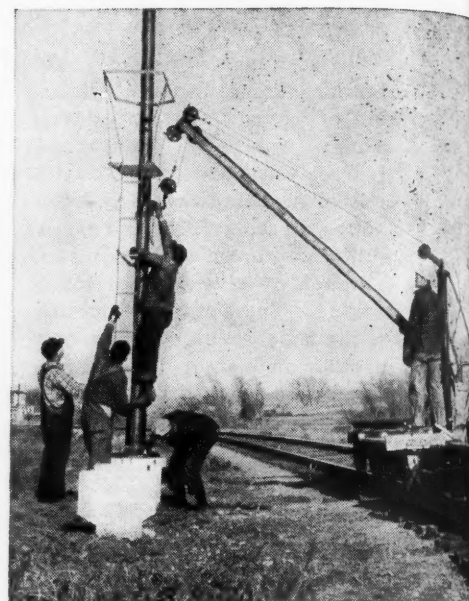
In "No. of Signals" column: s = semaphore; c = color-light; p = position light.

New Automatic Block Signaling Placed in Service During 1945 (Continued)

Railroad	Location	Miles of Road	Number of Signals	Manufacturer
Reading	Gladwyne, Pa.-W. Conshohocken	3.2d	5c	G.R.S.
	Replacement of old signals			
	Telford, Pa.-Sellersville	2.7d	4c	G.R.S.
	Replacement of old signals			
St. L.-S. F.	Winslow, Ark.-Schaberg	6.3s	3s	Union
	Welketa, Okla.-Wetumka	9.7s	10c	Union
St. L. S. W.	Texarkana, Ark.	2.0s	3c	Union
S. A. L.	Waxhaw, N. C.-Atlanta, Ga.	257.9s	366c	Union
	Tavares, Fla.-Elsworth	4.0s	8c	Union
Southern	John Sevier, Tenn.-Beverly	3.7d	3c	G.R.S.
N. O. T.	New Orleans, La.-Terminal Jct.	7.7d	13s	G.R.S.
S. P.				
T. & N. O.	Nacogdoches, Tex.-Garrison	16.0s	36c	Union
T. H. & B.	Fenwick, Ont.-Vinemount	16.3s		
	Welland, Ont.-Fenwick	5.4d		
U. P.	Grand Island, Neb.	0.6d	2c	Union
	Caliente, Nev.	1.0s	2c	Union
	Milford, Utah	2.5s	5c	Union
	Lynndel, Utah	1.4s	4c	Union
	Long Beach, Cal.	0.2s	2c	Union
	Las Vegas, Nev.	1.4s	4c	Union
Virginian	Norfolk, Va.	—d	7c	G.R.S.
Wabash	Jacksonville, Ill.-Markham	6.5s	9c	Union
W. P.	Poe, Cal.-Oroville	30.0s	14c	Union
	Part of C.T.C. installation			
		1,416.3s	108s	
		360.0d	2,189c	
		34.0t	53p	
		12.0f		
	Road Miles	1,791.3	2,350	
	Track Miles	2,193.3		

Legend:

In "Miles of Road" column: s = single track; d = double track; t = three track; f = four track.
In "No. of Signals" column; s = semaphore; c = color-light; p = position light.



Derrick, mounted on rail motor car trailer, aided considerably and saved time in the erection of signals during construction

Spring Switches Installed During 1945

Railroad	Total No. of Spring Switches Installed	Classification as to Application				Total No. Equipped With Facing-Point Lock	Signal Protection	
		End of Passing Track	End of Double Track	Junction	Yard Track		High Signals	Low Signals
A. C. L.	9	5	1	..	3	9	..	..
A. T. & S. F.	166	161	2	3	..	..	258	144
A. & W. P.	8	8	..	..	..	8	..	..
B. & O.	11	10	..	1	..	..	10	14
C. B. & Q.	20	19	1	..	..	20	16	6
C. of G.	55	55	..	..	..	55	..	..
C. I. & L.	4	4	..	..	..	..	8	..
C. I. M.	1	..	..	..	1	..	..	1
C. M. St. P. & P.	104	101	..	1	2	103	107	21
C. N.	6	5	..	1	..	..	2	10
C. & N. W.	2	..	..	2	..	..	..	1
C. & O.	5	5	..	..	..	4	4	3
C. P.	2	..	..	..	2	..	..	..
C. R. I. & P.	3	..	..	..	..	2	..	..
D. & R. G. W.	5	2	..	..	..	3	6	3
E. J. & E.	3	3	..	..	..	..	4	5
Erie	4	..	..	..	..	1	4	1
F. E. C.	1	..	..	4	..	4	8	2
G. N.	54	49	2	1	3	..	..	1
I. C.	42	41	..	..	1	54	104	1
L. & N.	98	94	..	1	3	..	40	2
L. V.	2	1	..	1	..	2	2	17
M.-K.T.	25	25	..	..	..	..	..	4
M. P.	4	3	..	..	1	4	5	4
M. St. P. & S. S. M.	4	3	..	..	..	4	7	4
N. C. & St. L.	3	..	2	1	..	..	..	3
N. P.	6	5	1	..	..	6	12	6
N. Y. C.	2	1	1	..	..	1	1	3
N. Y. C. & St. L.	10	9	..	..	1	9	9	10
Penna.	5	2	2	..	1	5	5	1
P. M.	5	5	..	..	..	5	2	..
St. L.-S. F.	17	17	..	..	..	16	32	..
St. L. S. W.	2	..	..	2	..	2	..	1
S. A. L.	18	16	..	2	..	18	38	..
Southern	29	29	..	..	..	..	..	3
A. G. S.	3	3	..	..	..	..	..	..
C. N. O. & T. P.	1	..	1	..	..	..	..	..
G. S. & F.	11	11	..	..	..	..	..	..
S. P.	8	6	..	..	2	5	12	3
T. & N. O.	3	1	1	..	..	..	..	2
T. & P.	2	1	..	..	1	..	..	..
Virginian	1	1	..	..	..	..	1	..
Totals	764	704	15	20	25	341	711	280

Car Retarder Projects Placed in Service During 1945

Railroad Yard	No. of Tracks	No. of Retarders	Rail Feet Retarders	No. of Switches	No. of Track Circuits	Signals	Skates	No. of Towers and Control Machines	Manufacturer
R. F. & P. SB	29	1	799	28	28	..	29	3	Union
Potomac Yd., Va.									

deford, in connection with the installation of new trackage between these points. The Chicago, South Shore & South Bend replaced two-position color-light signals with three-position signals on 10 miles of single track between Gary, Ind., and Wilson. The New York Central replaced semaphore signals with searchlight signals on 11 miles of double track and 2 miles of four track between Tivoli, N. Y., and Hudson; on 43 miles of double track of the Michigan Central between Kalamazoo, Mich., and Niles; and also on another 14 miles of double track of the Michigan Central between West Detroit, Mich., and Wayne. The Pacific Electric replaced color-light signals with searchlight signals on 10 miles of double track between Watts, Cal., and Long Beach, and on 9 miles of double track between Dominguez, Cal., and San Pedro. The Reading replaced Hall enclosed disk signals with light signals on 3 miles of double track between Gladwyne, Pa., and West Conshohocken and on 3 miles of double track between Telford, Pa., and Sellersville.

More Automatic Block

As part of C. T. C. installations, the Denver & Salt Lake installed automatic block on 25.3 miles of single track between Winter Park, Colo., and Orestod; the Pennsylvania on 45 miles of single track between Tyrone, Pa., and Lock Haven; and the Western Pacific on 30 miles of single track between Poe, Cal., and Oroville. At Fort Pierce, Fla., the Florida East Coast added signals to shorten block lengths. The St. Louis-San Francisco modified existing signals

between Winslow, Ark., and Schaberg on 6 miles of single track, while the Toronto, Hamilton & Buffalo respaced existing signals and added multiple aspects to cover increased train speeds between Welland, Ont., and Fenwick on 5 miles of double track. Reverse signals were added on 13 miles of single track between Newark, Del., and North East, Md., in multiple-track territory on the Pennsylvania. The Northern Pacific resigaled 11 miles of double track for signaling in both directions on both tracks between Stampede, Wash., and Martin.

Interlocking Construction

The total of 910 signal and switch units installed at new interlocking plants in 1945 is an increase of 59 units over the 1944 figure of 851 units. However, it is a reduction of 588 units compared with the total figure of 1,498 in 1943. During 1945 there were 940 signals and switches added at rebuilt interlockings, as compared with 687 the year previous. An accompanying table, covering new and rebuilt all-relay interlockings constructed in 1945, indicates that there were 65 new installations by 23 railroads and 18 rebuilt installations by 12 railroads. Another table, covering new and rebuilt interlockings with mechanical locking constructed in 1945, indicates that there were 20 new installations by 11 railroads and 48 rebuilt installations by 20 railroads. A total of

Automatic Interlockings Installed in 1945

Railroad	Location	No. of Signals	Manufacturer
B. & O.	Indiana, Pa.	8	G.R.S.
C. M. St. P. & P.	Sheldon, Iowa	4	Union
	Sioux Falls, S. D.	8	Union
C. N.	Villette, Man.	8	G.R.S.
C. & N. W.	Hicks, Iowa	8	
	Luther, Ill.	6	
	Butterfield, Minn.	6	
C. R. I. & P.	Grinnell, Iowa	10	Union
G. N.	Scarface, Cal.	4	G.R.S.
N. P.	Park City, Mont.	3	G.R.S.
St. L.-S. F.	Fairlawn, Mo.	6	Union
St. L. S. W.	Stamps, Ark.	6	Union
S. A. L.	Winder, Ga.	6	Union
	Walling, Fal.	5	Union
Total		88	

523 operative signal units were installed at new all-relay interlocking plants in 1945, compared with 448 in 1944, a decrease of 75 units. A total of 180 operative signal units were added at rebuilt all-relay plants in the same period, compared with the 1944 figure of 124. In 1945 there were 171 switches and derails operated by electric switch machines installed at new all-relay plants, as com-

All-Relay Interlockings Constructed in 1945

Railroad	Location	No. of Signal Operative Units	No of switches or derails operated by		Manu- facturer
			Electric Machines	Electro- Pneumatic	
NEW PLANTS					
A. T. & S. F.	Ridgeton-Olivet, Kan.	5	1	..	Union
	Gladstone, Kan.	6	2	..	Union
	Jacques, Kan.	6	2	..	Union
	Chelsea, Kan.	6	2	..	Union
	Salter, Kan.	6	2	..	Union
	Rose Hill, Kan.	6	2	..	Union
	East Jct., Kan.	3	1	..	Union
	Belle Plaine, Kan.	6	2	..	Union
	Clovis, N. M.	8	10	..	Union
	Gallup, N. M.	8	4	..	Union
	Barstow, Cal.	20	12	..	Union
	Barstow, Cal.	8	2	..	Union
B. & M.	Union Square, Mass.	5	3	..	G.R.S.
	Lawrence, Mass.	1	8	..	G.R.S.
	Winchendon, Mass.	5	..	..	G.R.S.
C. B. & Q.	Ashland, Neb.	7	4	..	Union
	Denver, Colo.	10	4	..	Union
C. & E. I.	Tuscola, Ill.	10	..	..	Union
C. of G.	Trammells, Ala.	4	1	..	Union
C. M. St. P. & P.	New Lisbon, Wis.	4	1	..	Union
	Sparta, Wis.	6	2	..	Union
	Watertown-Voltz, Wis.	8	2	..	Union
	Missouri River, Mo.	6	2	..	Union
	Madrid, Iowa	4	1	..	Union
	Pickering-Haverhill, Iowa	2	2	..	Union
	Sioux City, Iowa	2	1	..	Union
	Lawson, Mo.	4	1	..	Union
	Sturtevant, Wis.	..	1	..	Union
	N. Milwaukee, Wis.	15	10	..	Union
	Kansas City, Mo.	15	10	..	Union
C. & O.	Winchester, Ky.	7	..	..	G.R.S.
D. & R. G. W.	Soldier Summit, Utah	10	3	..	G.R.S.
	Noland, Utah	6	1	..	G.R.S.
	Lakota, Utah	2	1	..	G.R.S.
Erie	Wilders, Ind.	11	4	..	Union
	Columbus Jct., Pa.	13	7	..	Union
	Forest Hill, N. J.	11	5	..	Union
	Great Notch, N. J.	9	..	..	Union
K. C. S.	Kansas City, Mo.	5	..	..	G.R.S.
	Beaumont, Tex.	3	1	..	G.R.S.
L. & N.	Winchester, Ky.	11	..	..	G.R.S.
M. P.	Gale, Ill.	17	6	..	G.R.S.
M. St. P. & S. S. M.	Marshfield, Wis.	10	2	..	Union
N. C. & St. L.	New Johnsonville, Tenn.	4	3	..	Union
N. P.	Easton, Wash.	4	1	..	G.R.S.
	Lester, Wash.	3	1	..	G.R.S.
N. & W.	Eckman, W. Va.	26	..	10	Union
	Union, Ohio	7	..	1	Union
	Lurich, Va.	14	..	6	Union
N. Y. C.	Wayneport, N. Y.	13	4	..	G.R.S.
	Thurston, Ohio	6	2	..	G.R.S.
C. C. C. & St. L.	Oakland City, Ind.	9	3	..	G.R.S.
	Martel, Ohio	5	1	..	Union
Penna.	Harris, Freeport, Pa.	6	..	3	Union
	Beal, Pa.	6	..	3	Union
	Exermont, Ill.	13	8	..	Union
St. L. S. W.	Mt. Pleasant, Tex.	6	..	..	Union
S. A. L.	Jacksonville, Fla.	4	1	..	Union
	Jacksonville, Fla.	13	3	..	Union
T. R. R. A. of St. L.	Wellston, Mo.	9	3	..	Union
Virginian	Norfolk, Va.	18	9	..	G.R.S.
	Norfolk, Va.	17	7	..	G.R.S.
W. P.	Oroville, Cal.	17	..	..	Union
REBUILT PLANTS					
A. T. & S. F.	Ouenemo, Kan.	5	1	..	Union
	Clovis, N. M.	7	8	..	Union
	Belen, N. M.	14	8	..	Union
B. & M.	Springfield, Mass.	7	..	..	G.R.S.
	Revere, Mass.	5	..	..	G.R.S.
C. I. & L.	New Albany, Ind.	17	1	..	G.R.S.
C. M. St. P. & P.	Beloit Jct., Wis.	2	1	..	Union
C. S. S. & S. B.	Shearson, Ind.	8	..	..	Union
D. & H.	Oneonta, N. Y.	14	8	..	G.R.S.
D. L. & W.	Vestal, N. Y.	2	..	..	Union
	Train order signals	..	..	..	..
	Wayland, N. Y.	1	..	..	Union
	Train order signals	..	..	..	..
N. & W.	Kermitt, W. Va.	35	2	18	Union
	Blake, W. Va.	22	..	8	Union
N. Y. C.	Saline, N. Y.	18	12	..	G.R.S.
N. Y. C. & St. L.	Vermillion, Ohio	..	2	..	Union
P. E.	Corona, Cal.	4	4	..	Union
	Dominguez Jct.	10	8	..	G.R.S.
P. M.	Saginaw, Mich.	9	6	..	Union
Total New Plants		523	171	23	
Total Rebuilt Plants		180	61	26	

pared with 183 in 1944, a reduction of 12 units. There were 61 switches and derails operated by electric machines added at rebuilt all-relay plants, which is the same as the corresponding figure for 1944. An increase in the installation of electro-pneumatically-operated switches and derails at new and all-relay plants was indicated in 1945. At new all-relay plants switches and derails so operated totaled 23, as compared with 18 for the same period in 1944. Switches and derails operated electro-pneumatically at rebuilt plants totaled 26, compared with 20 in 1944.

Operative Signal Units

A total of 127 operative signal units, compared with 123 in 1944, were installed in 1945 at new interlocking plants with mechanical locking. At rebuilt plants of the same type 382 operative signal units were added, an increase of 116 units over the 1944 figure of 266. Switches and derails operated by electric machines at new and rebuilt plants of this type totaled 66 in 1945 compared with 88 in 1944, a reduction of 22 units. Switches and derails operated by electro-pneumatic machines at new and rebuilt plants with mechanical locking in 1945 totaled 73, as compared with 139 for the same period in 1944. A sizable increase was shown in the number of switches and derails operated by mechanical connections at such interlocking during 1945, in that the total at new and rebuilt plants was 218, as compared with 68 in 1944.

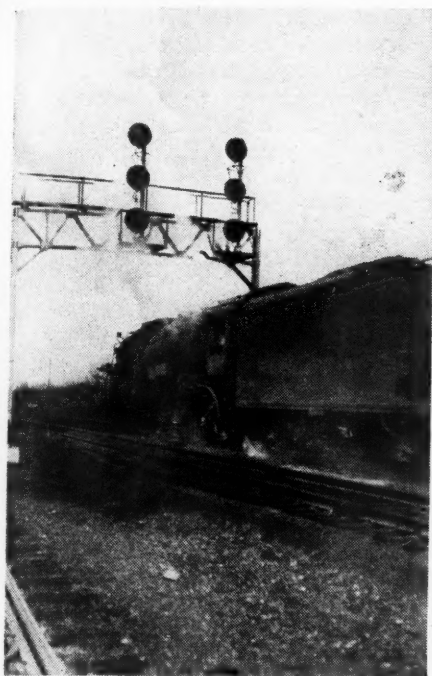
A total of 14 automatic interlockings were placed in service by 10 railroads during 1945, compared with 10 plants in the previous year. The number of signals totaled 88 which represents an increase of 28 units over the figure of 60 for the previous year.

Spring Switches

Spring buffer mechanisms on spring switches exceeded previous years in 1945 when a total of 764 such units were placed in service by 38 railroads. This figure represents an increase of 382 units when compared with 382 in 1944. A total of 341 mechanical facing point locks were installed on spring switches in 1945, as compared with 115 in 1944. During the same period 991 signals were installed to provide protection of train movements over spring switches, compared with 553 in 1944. Check of the table indicates that 166 spring switches were installed by the Santa Fe, 104 by the Milwaukee, 98 by the L. & N., 55 by the C. of G., 54 by the G. N., and 42 by the I. C. These figures represent the largest in the table. Of the 764 spring switches installed in 1945, 704 were at end-of-passing track locations, 15 at

Interlockings with Mechanical Locking Constructed in 1945

Railroad	Location	No. of Signal Operative Units	No. of Switches or Derails Operated by			Manu- fac- turer
			Electric Machines	Electro- Pneumatic	Mechanical Connection	
NEW PLANTS						
A. C. L.	Collier, Va.	9	6			Union
B. & O.	Garrett, Pa.	11	9			G.R.S.
	N. Baltimore, Ohio	7	7			G.R.S.
Erie	Kenton, Ohio	12	2			Union
I. C.	Minonk, Ill.	4				Union
N. Y. C.	Greendale, N. Y.	6	1			G.R.S.
N. Y. C. & St. L.	Lorain, Ohio	10				Union
Penna.	Conemaugh, Pa.	4		4		Union
	Johnstown, Pa.	6		3		Union
	East Pittsburgh, Pa.	3		3		Union
	Vandergrift, Pa.	8		8		Union
	Newman, Ohio	4		2		Union
	Newcomerstown, Ohio	6	2			Union
	Hewitt, Ohio	4	1			Union
R. F. & P.	Greendale, Va.	8		6	6	Union
St. L. S. W.	Fordyce, Ark.	7				Union
S. A. L.	Athens, Ga.	4			2	Union
	Toronto, Fla.	4				Union
	Leesburg, Fla.	4			2	Union
Union	Bessemer, Pa.	6				Union
REBUILT PLANTS						
B. & M.	Lawrence Mass.	13				G.R.S.
B. & O.	Layton, Pa.	6			6	G.R.S.
	Mt. Vernon, Ohio	12			8	G.R.S.
	Mt. Savage, Md.	7			9	G.R.S.
C. B. & Q.	Lincoln, Neb.	10	6		14	G.R.S.
C. N.	Turcot, Que.	2			4	
	Windmill Pt., Que.	6			8	
C. & O.	St. Albans, W. Va.	3	2			Union
C. R. R. of N. J.	Catasauqua, Pa.	8			7	Union
I. T.	Staunton, Ill.	4			2	Union
	Benld, Ill.	4			2	Union
	Auburn, Ill.	4			4	Union
L. & N.	Willoughby, Tenn.	5			4	G.R.S.
	Birmingham, Ala.	4			2	
	Strawberry, Ky.	10			5	
	Athens, Ala.	12	3			Union
	Part of C.T.C. installation					
	Junction City, Ky.	4			2	Union
	Part of C.T.C. installation					
M. P.						
I-G. N.	New Braunfels, Tex.	7			16	G.R.S.
	San Marcos, Tex.	6			8	G.R.S.
N. P.	Bozeman, Mont.		1			G.R.S.
	Duluth, Minn.	3				G.R.S.
	St. Paul, Minn.	2				G.R.S.
	Minneapolis, Minn.	4				G.R.S.
N. Y. C. & St. L.	New Haven, Ind.	14	5		7	Union
	Arcadia, Ohio				2	Union
N. Y. N. H. & H.	Myricks, Mass.	8			3	Union
	Waterbury, Conn.	15			13	Union
	New Haven, Conn.	37	10		10	Union
Penna.	Millham Jct., N. J.	20		18		Union
	Newark, Del.	14		15		Union
	Denholm, Pa.	8		5		Union
	Lock Haven, Pa.	6	1			Union
	Marsh, Ohio	6		6	9	Union
	Burnham, Ill.	7				Union
	Bucyrus, Ohio	2	4			Union
	Logansport, Ind.	12				Union
P. M.	Detroit, Mich.	25	6		26	Union
P-R. S. S.	W. Haddonfield, N. J.	9		3		Union
Reading	Sunbury, Pa.	6			2	Union
	West Milton, Pa.	21			12	Union
S. A. L.	DuPont, S. C.	4			2	Union
	Heath, S. C.	4			2	Union
	Parishville, S. C.	4			2	Union
	Barrelville, S. C.	4			2	Union
S. P.						
T. & N. O.	Chaison, Tex.	6			9	Union
	Englewood, Tex.					Union
Wabash	Napoleon, Ohio	6			2	Union
W. M.	Arlington, Md.	8			2	Union
Total New Plants		127	28	26	12	
Total Rebuilt Plants		382	38	47	206	



Signals and switches installed at new interlockings during 1945 increased 59 units, as compared with 1944—View is of train passing through new all-relay interlocking

end-of-double-track locations, 20 at junctions, and 25 at yard locations, compared with 307, 21, 13 and 36 units at the corresponding locations, respectively, in 1944. Of the 991 signal units installed at spring switches, 711 were high signals and 280 were dwarf signals, as compared with 155 and 398, respectively, in 1944.

Centralized Traffic Control

Centralized traffic control was placed in service on 1,734 miles of track, totaling 1,658 road miles, compared with 1,326 track miles and 1,265 road miles in 1944. The component figures of the 1945 total road mileage of 1,658 were 1,582 miles of single track and 76 miles of double track by 27 railroads on 43 projects. A total of 633 power switch machines were placed in service on C. T. C. projects in 1945, as compared with 596 in 1944. During the same period a total of 2,217 semi-automatic signals were installed, as compared to 2,141 during 1944. The total number of C. T. C. control machine levers for 1945 was 1,252, as compared with 1,374 in 1944. The majority of installations made in 1945 are coded.

Of the C. T. C. installations during 1945, the longest project included 139 miles of single track on the Milwaukee between Glencoe, Minn., and Milbank, S. D. The Burlington installed C. T. C. on 131 miles of single track between Hastings, Neb., and McCook. Centralized traffic control on 123 miles of single track and 5 miles of double track

Comparison of Annual Signaling Construction

	1945	1944	1943	1942
Automatic Block Signals	2,350	1,539	1,690	1,421
Interlockings				
Signals and switches at new plants	910	851	1,498	785
Signals and switches added at rebuilt plants	940	687	760	554
Signals and switches at automatic plants	88	62	55	78
Spring Switches				
Spring buffer mechanisms	764	382	448	284
Mechanical facing-point locks	341	115	88	126
Signals at spring switches	991	553	498	384
Centralized Traffic Control				
Power switch machines	633	596	463	263
Semi-automatic signals	2,217	2,141	1,775	1,030
Classification Yards				
Car retarders	14	25	....	51
Power switch machines	57	52	....	108
Highway Crossing Protection				
Protective units	1,089	643	477	1,297
Totals	10,394	7,646	8,752	6,381

Centralized Traffic Control Completed in 1945

Railroad	Location	Miles of Road	Direct Wire or Coded Control	No. of Levers	No. of Power Switches	No. of Signals	Manufacturer
A. C. L.	N. Petersburg, Va.-Collier	2.0d	C	3	1	2	Union
A. T. & S. F.	Melrose, N. M.-Joffre	93.0s	C	72	38	106	Union
	Algoa, Tex.-Houston	19.5s	C	43	30	47	Union
	Fullerton, Cal.-Riverside	42.8s	C	52	32	80	Union
B. & M.	East Fitchburg, Mass.	0.2d	DW	1	2	...	G.R.S.
	Extension of C.T.C.						
	Rollinsford, N. H.-Rigby, Me.	40.9d	C	45	30	33	Union
	Consolidation of control machines						
C. B. & Q.	Red Oak, Iowa	0.9d	C	4	3	8	Union
	Extension of C.T.C.						
	Hastings, Neb.-McCook	131.0s	C	80	36	150	G.R.S.
C. M. St. P. & P.	Delmar, Ill.-Puder	4.0s	DW	...	...	3	Union
	Faribault, Minn.-Mendota	46.6s	C	38	10	55	Union
	Glencoe, Minn.-Milbank, S. D.	138.9s	C	103	34	135	Union
	Woodward Jct., Iowa-Souton	4.0s	C	3	1	1	Union
	Comus, Minn.-Rosemount	27.5s	C	26	10	49	Union
C. & O.	Orange, Va.-Charlottesville	30.0s	DW-C	51	25	66	Union
	DG Cabin, Ky.-Limeville	3.5s	C	5	4	5	Union
	Extension of C.T.C.						
C. P.	Lennoxville, Que.-Sherbrooke	2.7s	DW	1	...	5	Union
	Manly, Iowa-Glenville, Minn.	19.8s	C	10	8	34	Union
C. R. I. & P.	Faribault, Minn.-Comus	6.5s	DW	4	1	7	Union
D. & R. G. W.	Provo, Utah-Mesa	11.9s	C	...	9	33	G.R.S.
	Unit wire changed to code and DT extended	7.3d					
	Salt Lake City, Utah-Midvale	1.4d	C	...	2	10	G.R.S.
	Extension of C.T.C.						
D. & S. L.	Denver, Colo.-Orestad	123.0s	C	120	63	181	G.R.S.
		4.6d					
I. C.	Eureka, Ky.-Kuttawa	6.9s	C	3	2	7	Union
L. & N.	Lebanon Jct., Ky.-Sinks	107.0s	C	59	20	88	Union
M. P.	Kirkwood, Mo.-LH Jct.	3.6d	DW	...	4	6	G.R.S.
	New DT; 2 power switches and 6 controlled signals removed						
G. C. L.	Algoa, Tex.-BM Siding	3.0s	C	...	1	5	Union
N. C. & St. L.	Nashville, Tenn.-Bruceton	92.3s	C	91	35	130	Union
N. P.	Pasco, Wash.-Ainsworth Jct.	...	DW	2	1	3	G.R.S.
N. & W.	Bluestone, W. Va.-Pocahontas, Va.	1.0s					
N. Y. C. & St. L.	North East, Pa.-Thornton Jct.	31.0s	DW	2	...	2	Union
Penna.	Tyrone, Pa.-Lock Haven	47.7s	C	62	18	97	Union
		5.0d	C	51	12	35	Union
		27.3s	C	31	10	32	G.R.S.
P. M.	Grandville, Mich.-East Saugatuck	...					
	Replacement of automatic block						
St. L. S. W.	Pine Bluff, Ark.-Lewisville	119.0s	C	84	40	161	Union
		2.0d					
S. A. L.	Manson, N. C.-Kittrell	20.0s	C	27	16	40	Union
	Extension of C.T.C.						
	Kittrell, N. C.-Youngville	14.0s	C	12	4	16	Union
	Extension of C.T.C.						
S. P.	Valrico, Fla.-Yeoman	11.0s	C	6	1	9	Union
	Lemay, Utah-Bridge	52.8s	C	...	35	113	Union
T. & P.	Willow Springs, Tex.-Big Sandy	19.6s	C	14	6	19	G.R.S.
		3.5d					
U. P.	Las Vegas, Nev.-Caliente	123.5s	C	...	54	218	Union
Wabash	Lafayette, Ind.-Delph	17.0s	C	10	4	20	...
	Extension of C.T.C.						
	Moberly, Mo.-Hannibal	66.1s	C	32	...	60	Union
	Manual block remote control						
	Springfield, Ill.-Jacksonville	30.9s	C	24	...	48	Union
	Manual block remote control						
W. & L. E.	Brewster, Ohio-Adena	57.0s	C	52	18	59	Union
W. P.	Poe Cal.-Oroville	30.0s	C	29	13	39	Union
		1,581.8s		1,252	633	2,217	
		75.9d					
	Road Miles	1,657.7					
	Track Miles	1,733.6					

Legend:

In "Miles of Road" column: s=single track; d=double track.
In "Direct Wire or Coded Control" column: C=coded control; DW=direct wire control; DW-C=direct wire and code.

Highway-Railroad Grade Crossing Protection Installed During 1945

Railroad	No. of Crossings	Total No. of Protective Units	No. of Wig-Wag Signals	No. of Flashing-Light Signals	No. of Rotating Disk Stop Sign Signals	No. of Traffic Type Stop-and-Go Crossing Signals	No. of Electrically-Operated Gates
A. C. L.	5	17		11			6
Alton	3	8		6			2
A. T. & S. F.	1	2		2			
A. & W. P.	2	4		4			
B. & M.	9	20		18			2
B. & O.	9	22		18			4
C. B. & O.	7	18		13			5
C. & E. I.	2	4		4			
C. of G.	4	8	1	4		3	
C. G. W.	1	2		2			
C. I. & L.	5	4		4			
C. & I. M.	1	2		2			
C. M. St. P. & P.	12	30	4	4	6		16
C. N.	30	74	4	50			20
C. & N. W.	17	64	9	29	8		18
C. & O.	6	22		22			
C. P.	10	21		21			
C. R. I. & P.	15	56		30			26
C. R. R. of N. J.	4	11		11			
C. S. S. & S. B.	3	4					4
D. & H.	1	4		4			
D. L. & W.	15	63		39		4	20
D. M. & I. R.	3	6			6		
D. & R. G. W.	1	4		4			
E. J. & E.	2	8					4
Eric	13	29		27			2
G. N.	10	19		2	17		
I. C.	14	47	3	32	8		4
K. C. S.	3	6		6			
L. & N.	14	43		35			8
M-K-T	1	2		2			
M. P.	12	32		24			8
M. & St. L.	2	4			4		
M. St. P. & S. S. M.	2	8		4	4		
N. P.	7	14			14		
N. & W.	4	10	4	2			2
N. W. P.	1			2			
N. Y. C.	35	86		62		2	22
N. Y. C. & St. L.	1	5		5			
N. Y. N. H. & H.	12	47		47			
P. E.	11	19	6	13			
Penna.	29	94		60			34
P. M.	4	8		4			4
Reading	1	4		2			2
St. L.-S. F.	6	11		9			2
St. L. S. W.	2	2		2			
S. A. L.	1	2		2			
S. D. & A. E.	2	4		4			
Southern	19	48		48			
A. G. S.	3	9		9			
G. S. & F.	2	4		4			
N. O. T.	1	2		2			
S. P.	10	19	1	12	4		2
T. & N. O.	4	9	1	6			2
T. C.	1	2		2			
T. H. & B.		2		2			
U. P.	4	8	2	6			2
Wabash	1	4		2			
W. & L. E.	1	2		2			
W. M.	1	2		2			
W. P.	1	2		2			
Totals	403	1,089	35	753	71	9	221

was placed in service by the Denver & Salt Lake between Denver, Colo., and Orestod. Other installations included 124 miles of single track between Las Vegas, Nev., and Caliente on the Union Pacific; 119 miles of single track and 2 miles of double track on the St. Louis Southwestern between Pine Bluff, Ark., and Lewisville; and 107 miles of single track on the Louisville & Nashville between Lebanon Jct., Ky., and Sinks. The Santa Fe installed C. T. C. on 93 miles of single track between Melrose, N. M., and Joffre, and the Nashville, Chattanooga & St. Louis made an installation on 92 miles of single track between Nashville, Tenn., and Bruceton.

On the Boston & Maine two control machines, controlling C. T. C. on 41 miles of double track between Rollinsford, N. H., and Rigby, Me., were consolidated into one, located at Dover, N. H. The Pere Marquette replaced automatic block with C. T. C. on 27 miles of single track between Grandville, Mich., and East Saugatuck.

Freight Classification Yards

In 1945 there was only one installation of car retarders in classification yards, namely, in the southbound Potomac (Va.) yard of the Richmond, Fredericksburg & Potomac. This installation involved 29 tracks, 3 towers, 3 control machines, 14 retarders, 799 rail ft., 28 detector track circuits, 29 power skates and 28 switches.

Highway Crossing Protection

In 1945 a total of 1,089 highway crossing protective units were installed by 57 railroads, as compared with 643 units installed in 1944, representing an increase of 446 units over the previous year. This increase may be explained by the anticipation of a heavy volume of highway traffic following the end of World War II, lifting of gasoline rationing, and the desire to provide the maximum possible protection at highway grade crossings. Of the 403 crossings in 1945, protection at 281 was financed by railroad funds, 83 by public funds and 39 by joint railroad and public funds. Of the total 1,089 protective units installed, 35 were wig-wag signals, compared with 34 installed in 1944; 753 flashing-light signals were installed in 1945, against 446 in 1944, which represents an increase of 307 such signals. A total of 71 rotating-disk stop sign signals were placed in service last year, as compared with 48 in the previous year of 1944. The number of electrically operated gates placed in service in 1945 is more than double the number installed during the previous year. In 1945, 221 such gates were placed in service, as compared with 102 during 1944, representing an increase of 119 such units.



Trench digging machine mounted on Caterpillar treads facilitated the laying of underground signal cables

Construction Followed War Pattern

Both new projects in 1945 and those carried over from previous year were of the types intended to speed traffic. Vast amount of deferred work remains

By **GEORGE E. BOYD**
Associate Editor

FOLLOWING the precedent set during the earlier war years, railway construction in 1945 consisted almost exclusively of those types designed to speed the movement of cars through yards and of trains on the road, as well as numerous projects to facilitate the servicing of locomotives, and others to shorten the period required for the repair of cars and locomotives. There were two reasons for the selection of such projects: first, that the movement of traffic without delay was paramount, and second, that the labor and materials available could not be stretched to include all of the projects that should have been carried out during this period.

Although German resistance collapsed early in May and that of Japan ceased on August 14, these projects were already well under way and were, therefore, carried to completion, for freight traffic showed no evidence of falling off until July, and did not register a decided decline until October. Furthermore, practically all of these projects were recognized as being needed for the handling of normal traffic, and in almost every case they represented the expansion of inadequate facilities or the replacement of facilities that had long been outmoded. For this reason, although these projects were undertaken as emergency measures, the railways lost nothing in carrying the work to completion.

It was readily evident that the demands imposed on the fixed properties by the existing record traffic could not be met to the fullest extent with facilities that were designed to handle a far smaller volume than was thrust upon the railways by war conditions. And this

As in all previous years since 1941, railway construction activities in 1945 were hampered by shortages of labor and to a large extent by difficulties encountered in the procurement of materials. Notwithstanding these deterrents, the volume of construction was about on the same level as that for the previous year. In character, the projects that were under way or completed followed the same pattern as those of the war period, in that they were selected with the view of speeding traffic. This form of selection has created a vast reservoir of other construction that needs to be done in the immediate future.

heavy traffic was not a local condition, but one that afflicted every road that was or that became a part of a through route under the system of controlled routing of traffic to expedite its movement to the fullest extent.

Much Construction Deferred

Among the reasons for many needed improvements on the railways was the fact that only the most necessary construction had been undertaken in any year since 1929, and the projects that had been authorized were generally of

small magnitude, partly because few roads could command the funds necessary to carry out construction on a large scale. Furthermore, it is doubtful whether large-scale projects would have been undertaken even if the funds had been available, because traffic remained at so low a level during the depression years that there was little need for enlarged facilities. It is true, however, that operating methods were changed radically during these difficult years and that, in many cases, the movement of even the small traffic of the period was handicapped by facilities that had grown obsolete.

It is inevitable that every facility for the transportation of persons and goods must suffer from a high rate of obsolescence because the demands of traffic are changing constantly, and the methods of handling and moving it must keep abreast of these current requirements. During the depression years, this tendency toward obsolescence in railway facilities was accelerated by reason of the unusual and extensive changes that were made in methods of transportation. However, because of the almost complete cessation of revision and expansion of these facilities as they approached the last stages of usefulness, conditions favorable to the expeditious movement of traffic deteriorated much more rapidly than they would have done under normal use.

For these reasons, when traffic began to increase by leaps and bounds with the opening of hostilities on the part of the United States, more railway facilities were either obsolete or inadequate for other reasons than ever before to meet the demands that were made upon them—demands that increased and became more urgent with each passing month. It was a miracle in transportation that enabled the roads to handle during the last four years the volume of traffic that came to them with little warning, with the many obsolete and inadequate facilities at their disposal.

Obviously, every effort was made to overcome these deficiencies, and many items of construction that were needed for immediate use were carried out year by year since 1941. However, there was such an accumulation of work that needed to be done that, despite all efforts, both the volume of traffic and

Miles of Main Track Built in the United States in 1945

State	Number of companies building	First track	Second track	Third track	Fourth track	Total
Florida	2	...	5.48	...	...	5.48
Indiana	2	1.90	7.19	...	...	9.09
Iowa	1	20.74	...	...	...	20.74
Kansas	1	3.47	...	...	...	3.47
Kentucky	2	15.90	...	...	...	15.90
Missouri	4	11.85	8.72	...	...	20.57
Michigan	1	...	2.36	...	...	2.36
Minnesota	1	...	4.22	...	...	4.22
North Carolina	1	...	2.49	...	...	2.49
North Dakota	2	6.37	...	...	...	6.37
Ohio	2	...	9.10	...	...	9.10
Pennsylvania	1	...	0.20	...	...	0.20
Utah	1	...	1.46	...	...	1.46
Virginia	1	...	1.97	...	...	1.97
Washington	1	0.11	...	...	...	0.11
West Virginia	1	4.75	...	...	...	4.75
Total	...	65.09	43.19	...	...	108.38

efforts to expedite its movement remained well ahead of the improvements that could be made to the fixed property. For this reason, conditions with respect to obsolescence and inadequacy of important facilities that were being used to make up and dispatch trains were still more aggravated at the beginning of 1945 than they were in 1941, despite the relatively large volume of work that had been completed since then.

A Few Types Given Preference

Since 1941 other types of construction have been put aside and efforts have been concentrated on those projects that affect most directly the assembly and dispatch of trains and the servicing of locomotives to get them back into road service in minimum time, and on those designed to facilitate the movement of trains on the road. As a corollary, however, these projects have included the enlargement of shops and power houses to provide modern and adequate facilities for the repair of locomotives and cars.

Like almost every other item of the fixed property, bridges were quite generally neglected during the decade following 1929. However, both cars and locomotives continued to increase in weight, and since about the middle of this decade, trains have been operated at speeds that were not even considered to be feasible at the beginning of the period. As a consequence, many bridges became inadequate to carry the increased loads and to withstand the increasing train speeds. While some of the poorest of these structures have been replaced and numerous others have been strengthened so that they could be retained in service, and while the sums expended for this work were well above normal, a large amount of similar work must be done in the immediate future, regardless of the volume of traffic.

In the effort to speed traffic, much attention was given to yard improvements, including the enlargement and rearrangement of existing yards and the construction of new yards, and nu-

merous projects of this type were either completed or under way at the end of the year. Likewise, many engine terminals were enlarged and improved and others were constructed. Although shops are not involved directly in the speeding of traffic, the replacement and enlargement of these facilities, as well as the

Miles of New Lines Completed in the United States Since 1830

Year	Miles	Year	Miles
1830	40	1888	7,066
1831	99	1889	5,707
1832	191	1890	5,739
1833	116	1891	4,620
1834	214	1892	4,648
1835	138	1893	3,024
1836	280	1894	1,760
1837	348	1895	1,420
1838	453	1896	1,692
1839	386	1897	2,109
1840	491	1898	3,265
1841	606	1899	4,569
1842	505	1900	4,894
1843	288	1901	5,368
1844	180	1902	6,026
1845	277	1903	5,652
1846	333	1904	3,832
1847	263	1905	4,388
1848	1,056	1906	5,623
1849	1,048	1907	5,212
1850	1,261	1908	3,214
1851	1,274	1909	3,748
1852	2,288	1910	4,122
1853	2,170	1911	3,066
1854	3,442	1912	2,997
1855	2,453	1913	3,071
1856	1,471	1914	1,532
1857	2,077	1915	933
1858	1,966	1916	1,098
1859	1,707	1917	979
1860	1,500	1918	721
1861	1,016	1919	686
1862	720	1920	314
1863	574	1921	475
1864	947	1922	324
1865	819	1923	427
1866	1,404	1924	579
1867	2,541	1925	644
1868	2,468	1926	1,005
1869	4,103	1927	779
1870	5,658	1928	1,025
1871	6,660	1929	666
1872	7,439	1930	513
1873	5,217	1931	748
1874	2,584	1932	163
1875	1,606	1933	24
1876	2,575	1934	76
1877	2,280	1935	45
1878	2,428	1936	93
1879	5,006	1937	148
1880	6,876	1938	38
1881	9,789	1939	58
1882	11,599	1940	26
1883	6,819	1941	54
1884	3,974	1942	74
1885	3,131	1943	56
1886	8,400	1944	121
1887	13,081	1945	65

construction of new shops and incidental facilities, had a large place in the year's program.

Among the types of construction undertaken to expedite the movement of trains on the road were the replacement



Alinement, grades and signals were improved materially on this 23-mile, \$2½ million line relocation of the Rock Island in Iowa during last year

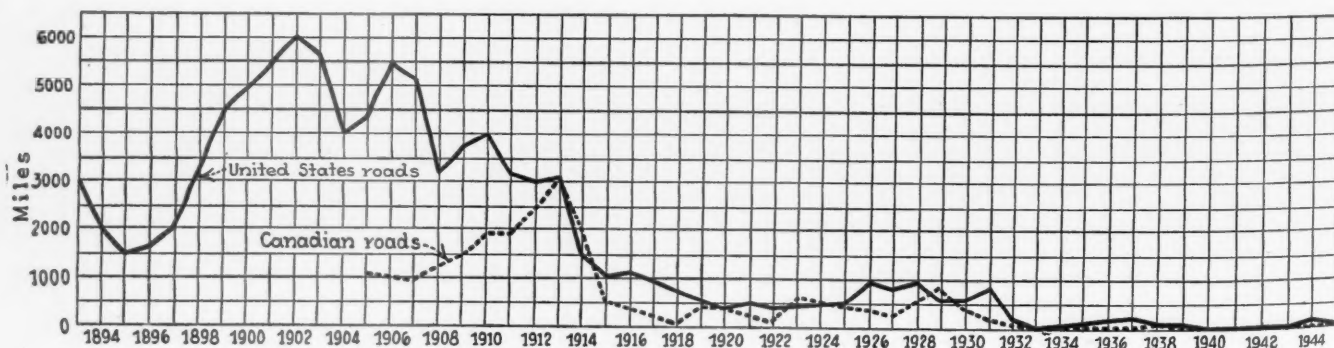
of obsolete block signals, new installations of centralized traffic control and the construction of new interlockings or the replacement of existing ones. Many of these projects necessitated the extension or rearrangement of existing passing sidings and the construction of new sidings. Fuel and water stations, important factors in keeping trains moving regularly, had a prominent place in many of the budgets.

Much Remains to Be Done

While the types of construction mentioned were typical, they by no means exhaust the list of work done during the year, as can be confirmed by reference

Miles of New Lines Completed in Canada Since 1904

Year	Miles	Year	Miles
1904	316	1925	414
1905	1,181	1926	335
1906	1,007	1927	310
1907	976	1928	723
1908	1,249	1929	841
1909	1,488	1930	385
1910	1,844	1931	250
1911	1,898	1932	121
1912	2,232	1933	0
1913	3,013	1934	1
1914	1,978	1935	2
1915	718	1936	1
1916	290	1937	0
1917	207	1938	101
1918	135	1939	1
1919	433	1940	2
1920	305	1941	1
1921	252	1942	1
1922	145	1943	3
1923	655	1944	0
1924	615	1945	15



Mileage of new lines constructed in the United States and Canada

to the construction projects listed at the end of this article. Yet the number and scope of these other projects were far more limited than at any time during the last quarter century, except at the depth of the depression. Some of the reasons for this were lack of man-power to carry out any but the most pressing items of construction; inability to obtain materials, except for work of urgent importance; and a desire to concentrate particularly on those types of work that would be most conducive to the expeditious and dependable movement of trains.

Taken as a whole, railway construction in 1945 was on about the same level as that for 1944. While most of the projects that were unfinished at the end of the year were of such a character or had progressed to the point that early completion may be expected, there are so many others that are equally imperative in the long view that could not be undertaken for the reasons given, that the surface has as yet scarcely been scratched, and there still remains the same need as before for a vast co-ordinated program of construction and reconstruction that will affect every type of facility, not only to expedite present traffic, but to meet post-war needs, when the railways will be called upon to meet more intensive competition than ever before.

That the railways themselves recognize this is shown by the recent announcement that, based on the assumption that the earnings of the immediate future will equal or exceed those for 1941, they are planning to expend during the next three years approximately \$800,000,000 on improvements to their fixed properties and an equal amount on equipment.

Since 1935, when federal appropriations for grade-crossing eliminations

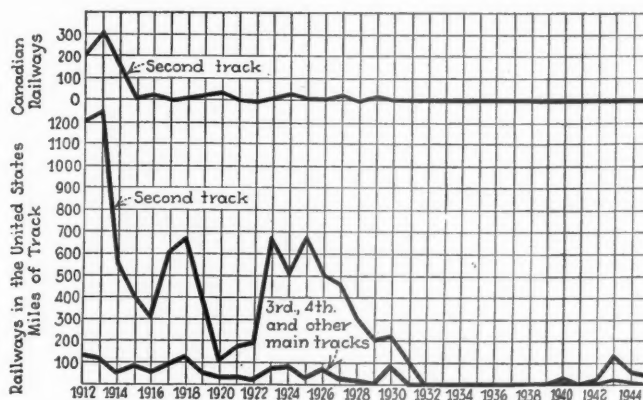
first became available, until 1944, this class of construction had represented a major item in the programs of most of the railways in the United States, although in all but a few cases the work was carried out by or under the supervision of the state highway officers, largely or wholly with funds provided through federal appropriations. In fact, a few small roads spent in this manner more money on grade separations than they had themselves spent on all other forms of improvements since their original construction.

Grade Crossings Negligible

In 1943 most of the grade-separation projects then under way were completed, so that very few were carried over into 1944. In the latter year, and again in 1945, primarily because of lack of federal appropriations, grade-separation

pleted or under way during the year; in fact there was a decrease of almost 50 per cent in the mileage built, compared with the previous year, the total being only 65 miles. However, several new-line projects are under survey. In general, these lines were authorized or are projected either to reach new resources or as parts of grade and line revisions.

During the 20-year period ending with 1925, the mileage of new lines completed annually varied from 5,623 in 1906 to 314 in 1920. The latter was the smallest mileage recorded up to that time for any year since 1847, when the long period of railway expansion was beginning to get under way. In contrast, during the succeeding two decades to and including 1945, the largest mileage completed in any year was in 1928, when 1,025 miles were placed in operation, and the smallest was 24 miles completed in 1933,



Mileage of multiple tracks constructed

work became almost negligible, and there is little prospect of any considerable revival of this activity in 1946.

No important new lines were com-

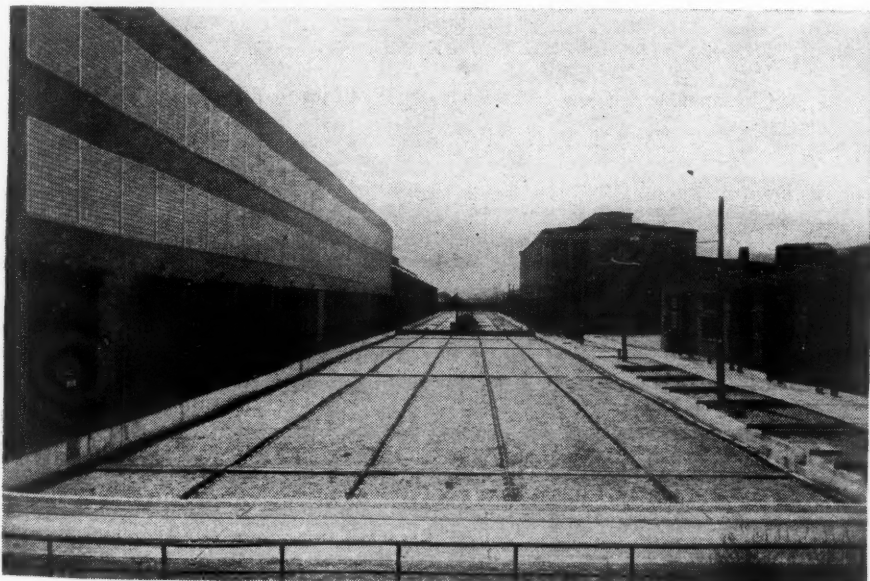
which still remains as the least mileage for any year since the first railway was constructed in 1830.

It is of still further interest that the aggregate mileage completed during the first period was 39,755, while that for the second period was 5,777, for it is significant that the average mileage completed year by year during the earlier period was 1,988, while the annual average for the second two decades amounted to 289, or but little more than one-seventh of the earlier average.

These figures show quite forcefully that the days of large external development are past and that in the future, as at present, expenditures will be applied more and more for internal improvements and for the expansion of those facilities that will expedite the movement of traffic, as well as to provide a well-balanced system of transportation.

Multiple-track construction likewise dropped about 50 per cent, being 43 miles compared with 76 in 1944. In 1945 no third or fourth track was completed and second track aggregated 43 miles compared with 61 during the previous year.

As has been mentioned, in general, the



Shops and terminal facilities had a large place in the improvement programs of the railways in 1945

primary purpose of the construction undertaken in 1945, as well as that which was carried over from the previous year, was to facilitate the movement of cars through yards and of trains on the road, or to expedite the handling and servicing of locomotives at terminals. For this reason, the construction of new yards; the construction, extension and relocation of passing sidings; the installation and improvement of automatic signals; the installation of centralized traffic control; and the application of remote control to switches; were all important

items in the improvement programs for the year. While this major objective overshadowed, it did not entirely obscure consideration of other needs, such as the replacement of light or otherwise obsolete bridges or exclude the prosecution of a much wider variety of projects, although the latter had a somewhat minor place on most of the programs.

Following is a detailed report by roads of construction projects completed during 1945, or still in progress at the end of the year, the individual cost of which approached or exceeded \$100,000:

Railway Construction in the United States

(Figures in parentheses indicate percentage of completion at the end of 1945)

Alton

Important Work Undertaken: Replacement of three spans of bridge over Mississippi river, Louisiana, Mo., \$284,000 (100).

Atchison, Topeka & Santa Fe

Important Work Undertaken: Relocation of segment of main track west of Frisbie, Kan. (100). Enlargement of enginehouse, Argentine, Kan. (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Melrose, N. M. to Joffre, (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Vaughn, N. M., to Mountainair (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Waynoka, Okla., to Oklahoma-Texas state line (50). Relocation of segments of main track, Belva, Okla., to Quinlan (50). Enlargement of freight house, Albuquerque, N. M. (100). Fueling facilities, Gallup, N. M. (100). Relocation of segment of main track, Cardiff, Cal. (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Atwood, Cal., to Fullerton (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Atwood, Cal., to Orange (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Riverside, Cal., to Atwood (100). Diesel locomotive repair facilities, Barstow, Cal. (100). Enlargement of enginehouse, Belen, N. M. (100).

(Gulf, Colorado and Santa Fe) **Grade-Crossing Elimination:** Subway: 8th street, Ft. Worth, Tex. (100). **Important Work Undertaken:** Centralized traffic control, including necessary track changes and installation of power-operated switches, Alcoa, Tex., to Houston (100). Replacement of Bridge 468-A, Dougherty, Okla. (100). Classification yard, Saginaw, Tex. (100). (Panhandle & Santa Fe) **Important Work Undertaken:** Extension of passing siding, Clear Creek, Tex. (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Oklahoma-Texas state line to Canadian, Tex. (100).

Atlantic Coast Line

Second Track: Collier, Va., to Appomattox river, 1.97 miles. At Yukon, Fla., 0.41 miles.

Important Work Undertaken: Replacement of open-deck trestle 2,093 ft. long, with single-track concrete slabs over Roanoke river, Norfolk, N. C., \$330,800 (50). Replacement of shop facilities, Montgomery, Ala., \$183,000 (25).

Baltimore & Ohio

Grade Crossing Elimination: Track Elevation: Grant City, Staten Island, N. Y., to Bay Terrace, joint with State, \$3,800,000 (20).

Important Work Undertaken: Improvements to Sycamore slip, Cleveland, Ohio, \$243,000 (100). Reconstruction of bridge No. 172/75, Washington, Ind., \$114,000 (100). Repairs to Kingwood tunnel, West End, W. Va., \$370,000 (100). Reinforce abutments, Bridge 14-A, Bradshaw, Md., \$131,000 (100). Spur track to Williams camp, Jerryville, W. Va., \$213,000 (100). Car service facilities, Arlington, Staten Island, N. Y., \$98,000 (100). Revision of alignment, bridge No. 25, Marriottsville, Md., \$130,000 (100). Team tracks, New York avenue, Washington, D. C., \$400,000 (100). Reconstruction of bridge No. 1, Grafton, W. Va., \$245,000 (100). Reconstruction of Bridge 22/6, Turner, W. Va., \$91,000 (100). Spur track from Beaver Dam branch, Midvale, Ohio, \$107,000 (100). Revision of alignment to accommodate municipal improvements, Massillon, Ohio, \$150,000 (99). Additional yard facilities, Wilmers, Del., \$590,000 (90). Improvements to Pier 24, Philadelphia, Pa., \$237,250 (75). Additional facilities 26th street yard, New

York, \$357,000 (70). Tracks and other facilities, Hamilton, Ohio, \$625,000 (60). Renewal of water main and sprinkler system on piers, Locust Point, Md., \$175,300 (40). Diesel facilities coach yard, Lincoln street, Chicago, \$95,000 (30). Construction of power plant, Grafton, W. Va., \$201,500 (20). Construction of Cone yard and engine-handling facilities, E. St. Louis, Ill., \$2,231,000 (10). Construction of new freight house No. 7, Chicago, \$145,000 (10). Reconstruction of Bridge 1730, Pt. Pleasant, W. Va., \$1,890,000 (10).

Boston & Maine

Second Track: North Berwick, Me., to Kennebunk, 12.4 miles, signaling for both directions and C. T. C.; also electric interlocking at South Portland, Me., \$325,000 (100).

Grade Crossing Elimination: Abandonment of Crossings: Crossing closed after abandonment of street, Depot crossing, Harvard, Mass., \$50 (100). Crossing closed after abandonment of street, Ayer's crossing, Newport, N. H., \$25 (100).

Important Work Undertaken: Shop extension, oil room, depressed floor, platforms, pumping equipment and washing facilities, at Diesel locomotive shop, Mechanicville, N. Y., \$336,000 (100). Replacement of two mechanical interlockings with one electric interlocking, including necessary track changes, Manchester, N. H., \$298,000 (100). Installation of interlocking, C. T. C. and rearrangement of signals, including the installation of longer crossovers, East Portal, Mass., to Hoosick Jct., N. Y., \$500,000 (50).

Central of Georgia

Important Work Undertaken: Construction of new steel bridge over Cahaba river, including line revision, west of Leeds, Ala., \$224,130 (100). Diesel shop facilities, Macon, Ga., \$190,000 (15).

Central R. R. of New Jersey

Grade Crossing Elimination: Five grade crossings abolished, Freemansburg, Pa. (100).

(New York & Long Branch) **Important Work Undertaken:** Renewal of fender racks Bridge 0/39 over Raritan river, Perth Amboy, N. J., \$110,400 (100).

Chesapeake & Ohio

First Track: Mt. Hope, W. Va., to Garden Grounds, 4.75 miles.

New Road Under Construction: Peaser Jct., W. Va., to near Leivasy, 4.76 miles.

Grade Crossing Elimination: Overcrossings: Dock, W. Va. (100). Subways: Widen subway, replacing timber trestle with steel span, Ivyton, Ky. (100).

Important Work Undertaken: Revision of alignment, Peake, Va., to Hanover, \$419,900 (48). Centralized traffic control, including necessary track changes and installation of power-operated switches, Strathmore, Va., to Greenway, \$278,675 (10). Extension of yard tracks and construction of second track through yard, Charlottesville, Va., \$135,000 (1). Relocation of main line, Panther Gap, Va., \$139,500 (30). Centralized traffic control, including necessary track changes and installation of power-operated switches, Staunton, Va., to Clifton Forge, \$379,800 (1). Double switching lead, Clifton Forge, Va., \$285,000 (1). Reconstruction of Bridge No. 1700-A, Snowden, Va., \$205,500 (1). Revision of alignment and construction of new tunnel, Ft. Spring, W. Va., \$2,254,500 (3). Extension of five tracks in east-bound yard, Hinton, W. Va., \$608,200 (10). Centralized traffic control, including necessary track changes and installation of power-operated switches, Sewell, W. Va., to MacDougall, \$289,950 (5). Replacement of coaling facilities, rearrangement of tracks and electrification of water station, West Hamlin, W. Va., \$171,500 (2). Extend four passing sidings, construct one new

passing siding, construction of water station, installation of centralized traffic control, including necessary track changes and installation of power-operated switches, Big Sandy Jct., Ky., to Beaver Jct., and color-light signals, Beaver Jct., Ky., to Elk Horn City, \$1,213,762 (28). Spur to serve coal mine development, Nigh, Ky., \$475,200 (50). Grade revision, Russell, Ky., \$123,600 (1). Extension of yard tracks, Stevens, Ky., \$251,425 (3). Water and coaling facilities, GB Cabin, Ohio, \$279,400 (25). Replacement of Bridge No. 635, Richmond, Ind., \$190,000 (1). Replacement of Pier 8 and installation of under-deck sprinklers, Newport News, Va., \$1,357,375 (100). Installation of automatic sprinklers and fire curtains, under-decks of Piers 2, 3, 4, 5 and 6, Newport News, Va., \$195,300 (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Orange, Va., to Charlottesville, \$187,900 (100). Revision of alignment and grade, including the replacement of stone arch over Rivanna river with deck-plate girder spans, Columbia, Va., \$358,692 (100). Extension and rearrangement of existing yard tracks and construction of new tracks, Gladstone, Va., \$320,200 (100). Revision of alignment, Mechums River, Va., \$117,700 (100). Tracks to serve ballast quarry, Greenlee, Va., \$101,000 (100). Extension of four tracks in westbound yard, Hinton, W. Va., \$325,000 (100). Spur on Mill creek to serve mine development, Mt. Hope, W. Va., \$575,950 (100). Reconstruction of Bridge No. 5129 over Big Sandy river, Big Sandy Jct., Ky., \$1,351,000 (100). Spur to serve mine development, Pardee, W. Va., \$508,000 (100). Extension and rearrangement of existing yard tracks and construction of additional tracks, Peach Creek, W. Va., \$234,500 (100). Spur to serve mine development, Kayford, W. Va., \$120,450 (100). Spur to serve mine development, Man, W. Va., \$1,101,000 (100). Extension of sidings and switchback, and construction of additional shop facilities, Rainelle, W. Va., \$187,600 (100). Spur to serve mine development, Van, W. Va., \$123,175 (100). Spur to serve mine development, Elk Horn City, Ky., \$993,000 (100). Spur to serve mine development, McDowell, Ky., \$158,000 (100). Spur to serve mine development, Caney Creek, Ky., \$116,000 (100).

New Lines Projected: Jenkins, Ky., to end of line beyond Pound, Va., 14.50 miles.

Chicago & Illinois Midland

Important Work Undertaken: Installation of coal and water facilities at Quiven, Ill., and Salem, \$100,000 (100).

Chicago & North Western

Important Work Undertaken: Reconstruction of double-track railway Bridge No. 185 with four I-beam spans on concrete pile substructure, six miles east of Cedar Rapids, Iowa, \$137,000 (50). Raise grade of tracks 2 to 3 ft.; fill scoured out holes and pave stream beds under Bridges No. 349, 350 and 351, vicinity of Salt Creek crossing, west of Belle Plaine, Iowa, \$136,000 (30). Construction of concrete caisson foundation for highway and electric Bridge No. N-1509 over Chicago & North Western tracks, Kinzie street, Chicago, \$160,000 (50). Construction of a series of nine deflection dikes, totaling 6,500 lin. ft., Missouri river bank protection, east of Pierre, S. D., \$277,500 (90). Raise grade 3 to 5 ft. over distance of 2.1 miles, raise and extend various bridges, construct new waterway openings, Logan, Iowa, to Missouri Valley, \$149,000 (20). Construction of 350-ton concrete coaling plant and locomotive wash rack, Council Bluffs, Iowa, \$128,000 (15).

Chicago & Western Indiana

Important Work Undertaken: Replacement of enginehouse turntable with 115-ft. table, lengthen three stalls of enginehouse, and replacement of coach yard turntable with enginehouse turntable, 49th street engine terminal and 51st street coach yard, \$116,225 (85).

Chicago, Burlington & Quincy

Grade Crossing Elimination: Overcrossings: Viaduct, Oregon, Ill., \$75,000 (100). Viaduct, east of Pacific Jct., Iowa, \$60,000 (100).

Important Work Undertaken: Extension of passing sidings, Lincoln, Neb., to Akron, Colo., \$334,393 (90). Centralized traffic control, including necessary track changes and installation of power-operated switches, Lincoln, Neb., to Hastings, \$538,502 (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Hastings, Neb., to McCook, \$628,000 (90). Diesel locomotive repair shop, Clyde, Ill., \$462,978 (100). Diesel locomotive repair shop, Denver, Colo., \$521,004 (75). Alterations to yard, relocation of main track and construction of coaling facilities, N. LaCrosse, Wis., \$535,107 (100). Rearrangement of 31st street yard, Denver, Colo., \$504,357 (90). Replacement, remodeling and expansion of inspection pit for Diesel locomotives, Chicago, \$267,270 (100). Restoration of slopes, Whitebreast Hill, Iowa, \$285,358 (100). Installation of car retarders, Lincoln yard, Lincoln, Neb., \$1,732,716

(98). Shop for heavy repairs to Diesel locomotives, W. Burlington, Iowa, \$469,142 (78). Replacement of existing 100-ft. turntable with one 135-ft. long, Galesburg, Ill., \$104,703 (100). Extension of passing sidings, Sheridan (Wyo.) division, \$121,485 (100). Improvement to shop building, Havelock, Neb., \$269,120 (100). Revision of alignment to reduce curvature, Greenwood, Neb., \$141,525 (5). Centralized traffic control, including necessary track changes and installation of power-operated switches, Flag Center, Ill., to Savanna, \$352,975 (5). Centralized traffic control, including necessary track changes and installation of power-operated switches, McCook, Neb., to Akron, Colo., \$382,428 (5). Revision of alignment, Stratford, Ill., \$157,458 (100). Replacement of powerhouse, including other incidental work, 23rd street, Denver, Colo., \$235,825 (5). Extension of passing sidings, Bristol, Ill., to Kewanee, \$111,175 (90). Installation of No. 20 crossovers, Herrington Jct., Wis., \$105,785 (70). Extension of passing sidings, Chana, Ill., to Chadwick, \$115,418 (100). Improvements to erecting shop, West Burlington, Iowa, \$105,014 (100). Car dump for handling grain cars at Murray elevator, Murray, Mo., \$182,886 (100). Revision of alignment, Callao, Mo., \$260,072 (20). Replacement of Bridge 20.50 washed out in May, 1945, Farley, Mo., \$700,000 (25).

Chicago, Milwaukee, St. Paul & Pacific

First Track: Tacoma, Wash., 0.11 miles. Birmingham, Mo., to Air Line Jct., Kansas City, 4.74 miles.

Second Track: Island Siding, Minn., to Indio, 3.51 miles, \$339,000. At Montevideo, Minn., 0.71 miles. Birmingham, Mo., to Air Line Jct., Kansas City, joint with Chicago, Rock Island & Pacific, 4.34 miles. Freight Line Jct., Mo., to W. Wye, Kansas City, joint with Chicago, Rock Island & Pacific, 0.32 miles.

Important Work Undertaken: Relocation of main line and construction of bridge over Missouri river to provide new entrance to Kansas City, Birmingham, Mo., joint with Chicago, Rock Island & Pacific and Kansas City Southern, \$3,500,000 (100). Revision of and addition to yard facilities, including additional engine terminal facilities in connection with new entrance to Kansas City, joint with Kansas City Southern, \$666,000 (100). Track elevation, Church street to Garnett place, Evanston, Ill., \$245,000 (100). Relocation of main track and raising grade to avoid damage from annual floods in Root river, Mound Prairie, Minn., \$141,000 (100). Relocation of main line to reduce curvature; remove station and water facilities from Kittredge, Ill., to Lanark, three miles west of Kittredge, \$140,000 (100). Replace westbound hump yard with enlarged flat-switching yard to accommodate longer trains, Bensenville, Ill., \$750,000 (100). Grade and line revision, Glenham, S. D., to Selby, 78 miles \$650,000 (55). Replacement of bridge over power canal, relocation of tracks, relocation of station and raising grade of tracks, Ottumwa, Iowa, \$165,000 (40). New two-story export freight house, Chicago, \$185,000 (30). New truck shop, new coach shop and alterations in present building, including track changes, Milwaukee, Wis., \$758,000 (5).

Chicago, Rock Island & Pacific

First Track: Perlee, Iowa, to Eldon, 20.74 miles. Wellington, Mo., to Air Line Jct., 4.52 miles. Wellington, Kan., 3.47 miles.

Second Track: Birmingham, Mo., to Air Line Jct., 3.86 miles.

New Road Under Construction: Floris, Iowa, to Centerville, 34.53 miles.

Grade Crossing Eliminations: Overcrossings: Part of Illinois river bridge, Harvard street, Peoria, Ill., portion over railway, \$40,000 (50). Roosevelt road, Little Rock, Ark., \$70,000 (65). United States Highways 81 and 66, El Reno, Okla., \$201,000 (60).

Important Work Undertaken: New line, including bridge over the Missouri river, to gain new entrance to Kansas City, joint with Chicago, Milwaukee, St. Paul & Pacific, Birmingham, Mo., to Kansas City; C. R. I. & P. proportion \$1,312,000 (100). Rearrangement and replacement of shop buildings, 47th to 51st streets, Chicago, \$1,700,000 (50). Replacement of old shop buildings, Cedar Rapids, Iowa, \$317,000 (100). Relocation of main line, Floris, Iowa, to Paris, 16.19 miles, \$1,882,910 (25). Relocation of main line, Paris, Iowa, to Centerville, 18.12 miles, \$2,700,000 (90). Relocation of main line, Wellington, Kan., 3.52 miles, \$359,000 (100). New through plate-girder spans over Sugar creek, Moscow, Iowa, \$227,000. Remodeling existing masonry and replacement of eight 200-ft. through pin-connected spans with through riveted truss spans over Red river, Terral, Okla., \$618,000 (70).

New Lines Under Survey: Ainsworth, Iowa, to Brighton, relocation, 17.30 miles.

Delaware & Hudson

Important Work Undertaken: Replacement of two steel bridges, Otego, N. Y., \$252,000 (100). Replacement of bridge, Wells Bridge, N. Y., \$131,000 (100). Construction of wye track and

other track changes at junction of two divisions, Nineveh, N. Y., \$130,000 (100).

Denver & Rio Grande Western

Second Track: Midvale, Utah, to Gaddie, 1.46 miles.

Grade Crossing Elimination: Subway: Diversion of highway to pass under Bridge 158.34, including grading, paving and drainage, Dotsero cutoff, Sweetwater, Colo., \$1,100 (100).

Important Work Undertaken: Repairing and rehabilitating 68 company cottages, Helper, Utah, and Soldier Summit, \$306,000 (75). Construction of 160-ft. by 122-ft. shop and garage for Rio Grande Motor Way, Salt Lake City, Utah, \$175,000 (25). Installation of automatic block signals, including necessary track changes, South Denver, Colo., to Bragdon, \$324,000 (25). Centralized traffic control, including necessary track changes and installation of power-operated switches, Fox Junction, Colo., to Orestod, 128 miles, \$1,100,000 (100). Construction of tunnel one-half mile under Continental divide, Tennessee Pass, Colo., \$826,100 (100). Extensions of passing sidings and extension of second track, American Fork, Utah, Riverton and Midvale, \$148,100 (100). Improvements to roundhouse facilities, Salt Lake City, Utah, \$138,700 (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, Grand Junction, Colo., to Agate, Utah, 48 miles, \$276,700 (100).

Detroit, Toledo & Ironton

Important Work Undertaken: Construction of new 100-ft. turntable and three-stall extension to existing enginehouse, including 60-ft. drop table, Jackson, Ohio, \$230,000 (90).

East Erie Commercial

Grade Crossing Elimination: Crossing eliminated when road abandoned, Erie, Pa., joint with Nickel Plate, \$188 (100).

Erie

Grade Crossing Elimination: Overcrossings: Construction of overhead Bridge H-7.18, to carry State Highway Route S-3 over tracks, Rutherford, N. J. (100). Reconstruction of Bridge 15.39 over State Highway No. 4, Warren Point, N. J. (1). Reconstruction of overhead bridge, H-39.69, Southfields, N. Y. (62).

Important Work Undertaken: Construction of new passenger station and freight house, including rearrangement of tracks and platforms, Ashland, Ohio (100). Construction of Diesel locomotive service and repair shop, Marion, Ohio (100).

Florida East Coast

New Road Under Construction: Ft. Pierce, Fla., to Utopia, 29.3 miles.

Important Work Undertaken: Construction of branch line, 29.3 miles, Ft. Pierce, Fla., to Utopia, including passing sidings, connecting and interchange tracks and automatic interlocking, \$1,250,000 (10).

Georgia Railroad

Grade Crossing Elimination: Crawfordsville, Ga., \$1,500 (100).

Great Northern

Second Track: Minot, N. D., to Des Lacs, \$185,700 (100).

Grade Crossing Elimination: Overcrossings: Pedestrian bridge, Seattle, Wash. (100). Replacement of overhead bridge, Nelson, Minn., \$8,500 (100). Replacement of overhead bridge, Melby, Minn., and Dalton, \$6,400 (started).

Subways: Malta, Mont., \$87,090 (100). Concrete wall to protect pedestrian subway, Willmar, Minn., \$2,750 (25).

Repairs to Existing Grade Crossing Structures: Repairs to overcrossing, 15th avenue and 14th street, Minneapolis, Minn., \$66,000 (100). Repairs to overcrossing, Como avenue, St. Paul, Minn., \$38,000 (100). Repairs to deck of overcrossing, Laurel avenue, Minneapolis, Minn., \$5,700 (100). Repairs to overcrossing, 7th street, Minneapolis, Minn., \$37,500 (10). Repairs to overhead bridges, Minneapolis, Minn., Hopkins and Wayzata, \$26,300 (100). Repairs to deck of overcrossing, Bridge 12.8, Minneapolis, Minn., \$7,900 (100). Repairs to overcrossing, Red Lake Falls, Minn., \$1,500 (100).

Important Work Undertaken: Application of ballast and installation of 112-lb. rail, Epping, N. D., to Avoca, \$111,600 (50). Widen embankment, apply ballast and install 112-lb. rail, Williston, N. D., \$417,100 (100). Application of ballast and installation of 112-lb. rail, Kremlin, Mont., to Buelow, \$592,700 (100). Widen embankment, apply ballast and install 112-lb. rail, Cut Bank, Mont., to Blackfoot, \$423,600 (100). Widen embankment, apply ballast and install 112-lb. rail, Shelby, Mont., to Cut Bank, \$441,000 (100). Widen embankment, apply ballast and install 112-lb. rail, Espanola, Wash., to Waukon, \$108,600 (100). Widen embankment and apply ballast, Mesaba division, Minn., \$103,150 (100). Widen

embankment and apply ballast, Willmar division, Minn., \$115,200 (100). Widen embankment and apply ballast, Spokane division, Wash., \$121,700 (100). Service and office building, ore docks, Allouez, Wis., \$116,000 (100). Repairs to ore docks, Allouez, Wis., \$753,300 (100). New power plant and installation of direct steaming, St. Paul, Minn., \$191,950 (100). Improve roadbed, Wolverton, Minn., to Finkle, \$110,000 (100). Enlargement of yard, Great Falls, Mont., \$179,000 (100). Construction of Diesel repair shop, Havre, Mont., \$381,700 (100). Revision of alignment, Acme, Mont., to Collins, \$116,000 (100). Renew bridge and fill portion of existing opening, Fairview, Mont., \$123,000 (100). Construction of Diesel shops and tanks, Great Falls, Mont., and Laurel, \$201,500 (100). Replace boilers in powerhouse, Havre, Mont., \$101,900 (100). Improvements to enginehouse, Whitefish, Mont., \$147,800 (100). Revision of alignment, Bonners Ferry, Idaho, \$134,200 (100). Revision of alignment, Red Eagle, Mont., to Belton, \$1,440,000 (100). Extension of yard, Whitefish, Mont., \$193,200 (100). Revision of alignment, Camden, Mont., \$300,000 (100). Connecting existing passing sidings, Fortine, Mont., to Tobacco, \$240,300 (100). Warehouse for United States Army, Seattle, Wash., \$250,700 (100). Fuel oil facilities for Diesel locomotives, Minot, N. D., Havre, Mont., and Spokane, Wash., \$240,300 (100). Repairs to roadbed, Wabpeton, N. D., to Moorhead, \$186,200 (75). Reconstruction of Bridge No. 1, Waneta, B. C., \$275,600 (100). Installation of snowsheds, Singleshott, Mont., \$552,000 (10). New station and office building, Willmar, Minn., 153,000 (to be completed in 1946). Repairs to ore dock, Allouez, Wis., \$471,650 (50). Construction of elevator, capacity 1,250,000 bu., Superior, Wis., \$1,179,300 (10). Construction of hotel for employees, Appleyard, Wash., \$100,000 (100).

Illinois Central

Important Work Undertaken: Rehabilitate train shed, Central station, Chicago, \$229,500 (100). Additional tracks, installation of crane and runway, car repair yard, Centralia, Ill., \$118,560 (100). Construction of tracks for Delta Coal Mining Company, Delta Mine, Ill., \$106,000 (100). Rehabilitate passenger station, Dubuque, Iowa, \$116,420 (100). Reconstruction of bridge over Little Sioux river, Cherokee, Iowa, \$144,500 (25). Construction of tracks to serve the Rustein Coal Mining Company, Richland, Ky., \$101,710 (100). Construction of tracks to serve the Beech Creek Coal Company, Greenville, Ky., \$249,880 (90). Construction of tracks to serve the Homestead Coal Company, Daniel Boone, Ky., \$141,840 (90). Replace arch over Lynch creek with girder span, Jackson, Miss., \$123,770 (40). Renew approaches to Loosahatchie River bridge, Woodstock, Tenn., \$110,360 (100).

Kansas City Southern

Important Work Undertaken: Reconstruction of Bridge A-307, including reinforcing present superstructure and construction of four new piers across Arkansas river, Redlands, Okla., \$288,545 (40).

Louisville & Nashville

First Track: Millport, Ky., to Briar Creek, 2.88 miles. Drakesboro, Ky., to Kirks Mine 3 duple, 2.10 miles. Cornick, Ky., to Hart, 2.38 miles.

New Road Under Construction: Golva, Ky., to Glenbrook, 12 miles. Nortonville, Ky., to unnamed station, 4.77 miles.

Grade Crossing Eliminations: Subway: Dossett, Tenn., \$100,000 (50).

Important Work Undertaken: Centralized traffic control, including necessary track changes and installation of power-operated switches, Lebanon Jct., Ky., to Sinks, \$542,000 (100). Replacement of 11,627 ft. of creosoted timber trestle with reinforced concrete trestle on bridge over Ohio river at Henderson, Ky., \$970,000 (1). Centralized traffic control, including necessary track changes and installation of power-operated switches, Strawberry, Ky., to Henderson, \$856,764 (3).

Maine Central

Important Work Undertaken: Improvement of engine terminal facilities, including 2-track deep-water ash pit; 1,500-ton sand house and tower; enginehouse and track changes, Bangor, Me., \$145,000 (100).

Massena Terminal

Grade Crossing Elimination: Overcrossings: Park avenue, Massena, N. Y., \$56,000 (100). Center street, Massena, N. Y., \$31,000 (100). E. Orvis street, Massena, N. Y., \$86,000 (100). E. Hatfield street, Massena, N. Y., \$54,000 (50).

Important Work Undertaken: Replacement of bridges across Grasse and Racquette rivers, including grade separations at E. Hatfield street, Orvis, Center and Park avenues, Massena, N. Y., \$1,200,000 (70).

The Minneapolis & St. Louis

Important Work Undertaken: Construction of

Diesel engine repair shop, Minneapolis, Minn., \$100,000 (75).

Minneapolis, St. Paul & Sault Ste. Marie

Grade Crossing Elimination: Subway: State Highway No. 100, west of Minneapolis, Minn., \$70,000 (100).

Missouri-Kansas-Texas

Grade Crossing Elimination: Subway: State Highway No. 19, Atoka, Okla., \$129,000 (100).

Important Work Undertaken: Raise main track across North Canadian river, including existing bridge and installation of seven additional 100-ft. girders, also riprap and jetties, Eufaula, Okla., \$550,000 (35). Rearrangement of freight house, St. Louis, Mo., \$260,000 (100).

Missouri Pacific

Second Track: Kirkwood, Mo., to Barretts, 4.06 miles.

Grade Crossing Elimination: Overcrossings: United States Highway No. 69, Wagoner, Okla., \$75,000 (95). Route 132, Dupo, Ill., joint with Gulf, Mobile & Ohio, \$65,000 (100). Glenwood Lane, Kirkwood, Mo., \$15,500 (100). Couch avenue, Kirkwood, Mo., \$16,000 (100). United States Route No. 64, Gore, Okla., \$40,000 (started). United States Highway No. 49, Sabula, Mo., \$100,000 (started).

Important Work Undertaken: Tracks to serve mine, Johnston City, Ill., \$214,000 (100). Revision of grade, Hilliard, Mo., \$255,000 (100). Reconstruction of five bridges, Reader, Ark., \$103,000 (100). Construction of bridge over Cache river, Cache, Ill., \$162,000 (25). Reconstruction of Bridge 87, Yancopin, Ark., \$548,000 (90). Revision of alignment and reconstruction of Bridge 105, Riverton, La., \$743,800 (100). Raising grade of tracks, Pleasant Hill, Mo., Greenwood and Avon, \$286,500 (100). Raising grade of track, Little Blue, Mo., \$528,400 (50). Construction of trestle, Northrup, Mo., \$119,100 (10). Construction of electric shop, Sedalia, Mo., \$130,650 (100). Construction of second main track, 4.06 miles, HI-IH Jct., Mo., \$389,000 (100). Construction of lap sidings, Comiskey, Kan., Paola, Osawatomie, Ottawa and Council Grove, \$206,500 (90). Revision of alignment, Otis, Kan., \$103,975 (100). Additional sidings, Little Rock, Ark., \$112,150 (100). Improvement to enginehouse, Dupo, Ill., \$240,000 (100). Dependable main line work, Pleasant Hill, Mo., \$286,500 (100). Revision of alignment, Barretts, Mo., \$315,000 (100).

Nashville, Chattanooga & St. Louis

Grade Crossing Elimination: Overcrossing: Replacement of overhead bridge, Jones avenue, Atlanta, Ga., \$100,000 (50).

Important Work Undertaken: Grade reduction, Nashville division, \$1,255,000 (100).

New York Central

Grade Crossing Elimination: Walbridge road closed, Harbor Creek, Pa., \$100 (100). Reconstruction of bridge over North street, Rochester, N. Y., \$297,000 (37). Reconstruction of subway for accessory roads in connection with relocation of U. S. Route 60, Malden, W. Va., \$112,000 (100).

Important Work Undertaken: Revision of alignment to reduce grades from 2 deg. to a maximum of 1 deg., Canastota, N. Y., \$322,000 (75). Installation of approved signaling, East Syracuse, N. Y., to Salina, for four-track operation, including additional crossovers and installation of power-operated switches, \$113,000 (100). Installation of elevated platforms, water and lubricating oil facilities in existing paint shop, installation of fuel pumps, pipe lines and various outlets for servicing locomotives, including overhead sanding facilities, Harmon, N. Y., \$103,500 (100). Providing inter-track spaces in repair yards, with reinforced concrete pavement, jacking timbers and additional drains, Selkirk, N. Y., \$158,000 (100). Reconstruction of bridges over Kinderhook creek and Stockport creek, including relocation of tracks, Stockport, N. Y., \$131,500 (90). Additional track and signaling facilities for improved operations at Wayneport coaling plant, Wayneport, N. Y., \$112,250 (100). Replacement of Bridge 707, Rochester, N. Y., \$100,000 (5). Replacement of timber trestle bridge No. 45, Iona Island, \$300,000 (5). Track to serve Muskingum Coal Company, Tropic, Ohio, \$115,000 (100). Replacement and reconstruction of pile bridge over Sandusky bay and filling one bridge, Sandusky, Ohio, \$652,000 (100). Locker, toilet and store room buildings at engine terminal, Collingwood, Ohio, \$143,430 (80). Coach washer, Root Street yard, Chicago, \$100,000 (80). Track changes and new bridge, Kenton, Ohio, \$127,000 (40). Service building, Root Street yard, Chicago, \$180,000 (100).

(Michigan Central) *Second Track:* 2.36 miles, at Detroit, Mich.

Important Work Undertaken: Extension of seven yard tracks and other track changes; net additional track 14,000 ft., Jackson Jct., Mich.,

\$180,000 (100). Construction of meat transfer house, including three cold storage rooms, installation of refrigerating machinery and monorail, Detroit, Mich., \$152,800 (75).

(Cleveland, Cincinnati, Chicago & St. Louis) *First Track:* Coe, Ind., 1.9 miles.

Important Work Undertaken: Restoration of Plum Street warehouse destroyed by fire, Cincinnati, Ohio, \$127,880 (100). Installation of automatic signals with power-operated switches at Paget, Ohio, and Edison; 31 miles Burt, Ohio, to Paget, \$169,100 (100). Pressure grouting for exposed portions of arch piers and construction of 13-ft. extensions at each end of Bridge 242, Weisburg, Ind., \$169,000 (100). Replacement of out-bound freight house destroyed by fire, construction of concrete paved driveway, and relocation of tracks, Indianapolis, Ind., \$482,250 (100).

(Indiana Harbor Belt) *Important Work Undertaken:* Relocation of freight yard, East Chicago, Ind., \$178,000 (100).

(Pittsburgh & Lake Erie) *Second Track:* 0.20 miles, Pa.

Important Work Undertaken: Relocation and extension of West Homestead yard tracks, including additional retaining walls, sewers and new yard office, Homestead, Pa., \$256,000 (95).

New York, Chicago & St. Louis

Second Track: Milepost 286 to Milepost 286.13, Ohio, 0.13 miles.

Important Work Undertaken: Revision of grade and extension of passing siding, Boyleston, Ind., \$156,960 (95). Replacement of stationary boilers and boiler house, Frankfort, Ind., \$275,000 (70). Revision of alignment to reduce curves, Arcadia, Ohio, \$116,483 (100). Installation of centralized traffic control and extension of passing sidings, So. Whitley, Ind., to Claypool, \$203,337 (1). Raise the grade of main and yard tracks, Cayuga, Ind., \$152,900 (71). Installation of centralized traffic control and extension of passing sidings, Arcadia, Ohio, to St. Marys, \$656,742 (1). Extension to machine shop building, Conneaut, Ohio, \$174,975 (100). Centralized traffic control, including necessary track changes and installation of power-operated switches, North East, Pa., to Thornton, Jct., \$298,131 (100). Installation of centralized traffic control, extension of passing siding and installation of power-operated switches, Arcadia, Ohio, to New Haven, Ind., \$467,308 (7). Construction of enginehouse, machine shop and powerhouse, Bellevue, Ohio, \$1,429,350 (14). Reconstruction and extension of bridge No. 247.17, Bellevue, Ohio, \$105,420 (100). Additional tracks and grading, westbound yard, Bellevue, Ohio, \$155,800 (68).

New York, New Haven & Hartford

Important Work Undertaken: Reconstruction of busses and circuit breakers at power plant, Cos Cob, Conn., \$458,270 (40). Installation of capacitors at substations, electric zone, \$239,600 (25). Installation of car retarders, Montwese yard, Montwese, Conn., \$145,000 (100). Reconstruction of two northerly spans of bridge No. 2.80, Cedar Hill, Conn., \$115,000 (90). Revision of track in connection with signal changes, Brayton avenue, Providence, R. I., \$378,300 (started). Construction of Diesel locomotive shop facilities, New Haven, Conn., \$675,000 (10). Construction of car washing facilities, Boston, Mass., \$150,000 (20). Construction of new dormitory building for railroad employees, Cedar Hill, Conn., \$200,000 (100). Alterations to Diesel locomotive shop, Boston, Mass., \$135,000 (100).

New York, Susquehanna & Western

Important Work Undertaken: Revamping of existing Diesel locomotive shop and roundhouse, Little Ferry, N. J., \$110,000 (to be completed in 1946).

Norfolk & Western

First Track: Extension of Levisa Branch, Ky., 8.54 miles.

Grade Crossing Elimination: Subways: Ironton, Ohio, permits elimination of two grade crossings, \$40,000 (100).

Relocation of Highway: Construction of parallel street to permit elimination of three grade crossings, Abingdon, Va., \$18,000 (100).

Important Work Undertaken: Extension of passing siding 1,851 ft., installation of power-operated switches and signals for operation in both directions, Elkhorn, W. Va., \$120,000 (100). Construction of extension of Levisa Branch, 8.54 miles, from Virginia-Kentucky state line to mouth of Big creek, including spur track up Big creek, 2.25 miles, \$982,000 (100). Centralized traffic control, including installation of power-operated switches and necessary track changes, Cowan, Va., to Bluefield, W. Va., \$440,000 (100). New single-track bridge 663 ft. long, including 190-ft. Bascule lift span and necessary track changes, Norfolk, Va., \$750,000 (50). Installation of 3,570 ft. of additional trackage, water columns, engine service building, two ice houses, two 135-ft. inspection pits, concrete engine washing platform and ash disposal plant, Williamson, W. Va., \$300,000 (75).

Construction of spur track, 1.04 miles up Feds creek, Pike County, Ky., \$155,000 (100). Installation of car retarders, Portsmouth, Ohio, \$150,000 (20). Installation of new steel girders, precast concrete slabs, rebuilding of back walls and bridge seats, six bridges, Norfolk, Va., to Roanoke, \$110,000 (10). Construction of new fireproof pier, including warehouse, two land warehouses, two gantry cranes, 150-ton track scale, supporting trackage and concrete driveways, Lambert Point, Va., \$5,750,000 (5). Construction of tracks to serve coal cleaning and loading plants, Witcoe, W. Va., \$530,000 (25). Installation of 15 new deck-plate-girder spans 944 ft. long and 6 steel bents with concrete piers and pedestals, Glen Jean, Ohio, \$220,000 (10). Installation of centralized traffic control and extension of five passing sidings, Walton, Va., to Bristol, \$1,116,500 (50). Installation of power-operated switches at each end of three tunnels in lieu of gauntlet arrangement for double-track through these tunnels, Naugatuck, W. Va., to Webb, \$131,800 (100). Construction of 1.11 miles of spur track up Second fork of big creek and siding layout to coal mine, Levisa branch, Ky., \$304,000 (20).

Northern Pacific

First Track: Truax Jct., N. D., to Truax, 6.37 miles.

Important Work Undertaken: Construction of new car shop, storage building and concrete platforms, including machine tools, Brainerd, Minn., \$1,749,500 (80). Construction of two-story brick storehouse, pipe storage building, concrete platforms, ramps and roadways, Duluth, Minn., \$182,800 (85). Construction of new second main track, new switching leads and ladder tracks in yard, I-beam bridge, channel changes, etc., Jamestown, N. D., \$446,400 (75). Construction of new main line 500-ton steel coal dock, stand pipes, water and drain lines, Beach, N. D., \$107,000 (20). Additional yard tracks for use as eastbound train yard, Laurel, Mont., \$159,000 (100). Construction of power plant and new journal packing building, Livingston, Mont., \$315,000 (100). Construction of new single-track main-line tunnel, 2,850 ft. in length with 800 ft. of open cut, Muir, Mont., \$1,050,500 (100). Construction of new 16-stall roundhouse, turntable and trackage, Helena, Mont., \$560,000 (75). Construction of new main line coal dock, sanding facilities and trackage, Kootenai, Idaho, \$175,000 (100).

Pacific Coast

Grade Crossing Elimination: Overcrossing: To connect Highway 99 to Highway 10, Seattle, Wash., also crosses Northern Pacific and Union Pacific, \$137,288 (10).

Pennsylvania

Second Track: At Greenfield, Ind., 7.19 miles.

Grade Crossing Elimination: Blands private crossing, Newark, Del. (100). Private crossing to freight station, Altoona, Pa. (100).

Important Work Undertaken: Electrical stand-by facilities, Sunnyside yard, Long Island City, N. Y. (100). Reconstruction of stock yards, low water-deck earth-filled pier to replace facilities destroyed by fire, and reconstruction of main shed with lean-to facilities, Jersey City, N. J. (100). Four new stores on south side of Long Island concourse, Pennsylvania station, New York (7). Expansion of parcel room facilities and addition to Savarin buffet, east of Long Island ticket windows, Pennsylvania station, New York (100). Extension to freight station, 37th Street yard, New York (100). Addition to station master's office, Pennsylvania station, New York (100). Reconstruction of bridge over Lopatcong creek, Phillipsburg, N. J. (80). Revision of alignment, extension and rearrangement of coaling tracks, Denholm, Pa. (100). Rearrangement of tracks in Shackamaxon street freight yard, and construction of storage track, public team tracks, driveways, etc., Philadelphia, Pa. (100). Rearrangement of crossovers, provision for electric switch heaters and retirement of station building in connection with replacement of mechanical interlocking with electro-pneumatic interlocking, Holmes interlocking, Philadelphia, Pa. (40). Alterations and additions to station building, North Philadelphia, Pa. (25). Dormitory and recreation building for trainmen, Enola, Pa. (100). Two additional relay tracks, Baltimore Old Line, Enola, Pa. (100). Dormitory and recreation building for trainmen, Harrisburg, Pa. (100). Alterations and repairs to Hoffman house, Harrisburg, Pa. (100). Compressed air facilities, Enola, Pa. (90). Placing 16-in. steel water pipe across Christiana river, Wilmington, Del. (100). Car retarders westbound classification yard, Enola, Pa. (100). Transfer bridge and supporting yard, Greenwich yard, Philadelphia, Pa. (100). Revision of alignment and extension of middle platform, Wilmington, Del. (100). Ferry facilities and reconstruction of bulkhead, first section, Cape Charles, Va. (100). Ferry facilities and reconstruction of bulkhead, second section, Cape Charles, Va. (100). Rearrangement of and addition to tracks, Kensington freight station, Philadelphia, Pa. (20). Three additional tracks and one additional driveway, Patterson Tract, Washington,

D. C. (100). Development of property Queens Chapel road, Washington, D. C. (50). Ventilating fans and nozzle to ventilate tunnel No. 3, Gallitzin, Pa. (100). Two additional relay tracks for westbound trains in Pitcairn district, East Pittsburgh, Pa. (100). Gas switch heaters at two interlocking plants, Terminal yard, Pittsburgh, Pa. (100). Relocating steam line to 24th street, Terminal yard, Pittsburgh, Pa. (100). 2,970 ft. of concrete toe wall for bank protection, Sterling Run, Pa. (100). 1,901 ft. of concrete toe wall for bank protection, Huntley, Pa. (100). Reconstruction of Bridge 175.42, Mansfield, Ohio (100). Installation of 110-ft. turntable to replace one 100 ft. long, Canton, Ohio (100). 800-ft. extension to track pans, Millbrook water station, Wooster, Ohio (100). New block and interlocking station and remote control at west end of passing siding, Black Run, Ohio (100). Reconstruction of part of Dock No. 20, Cleveland, Ohio (25). Construction of 8.97 mi. of third track, signaled for westbound movement, Crestline, Ohio, to Bucyrus (75). Erection of a 100,000-gal. water station and 300-ton coaling plant, and extension of second track 6,000 ft., Harvey, Ohio; installation of 50,000-gal. water station at Richland, Ohio; and portable coaling station at Tiffin, Ohio (100). Construction of 16,000 ft. of yard track and 14 turnouts, Hughart yard, Grand Rapids, Mich. (75). Installation of remote control for switches serving sidings at Alton, Ohio, incidental to track changes, respacing of signals and fireproofing tower at London, Ohio (100). Construction of 7.19 mi. of second track, reduction of grade to 0.7 per cent and completion of second track between Richmond, Ind., and Indianapolis (100). Construction of five auxiliary yard tracks with switches at east end of yard, including remotely controlled main track crossovers, also run-around track from A. & S. interchange to enginehouse, Rose Lake, Ill. (100). Increase capacity and modernization of coach yard, construction of platforms serving 8 tracks, with capacities ranging from 12 to 19 cars, and the placing of all utilities underground in concrete tunnel, 12th Street coach yard, Chicago (15). Installation of remote control for east switch of siding at New Paris, Ohio, and west switch of siding at Herwitt, Ohio, in connection with the respacing of signals in this territory (100). Approximate cost of the foregoing projects \$14,738,467.

(Long Island) *Important Work Undertaken:* Construction of trainmen's building, Jamaica, N. Y. (5).

Pennsylvania-Reading

Important Work Undertaken: Reconstruction of Broadway overhead bridge, Camden, N. J. (100).

Pere Marquette

Important Work Undertaken: Reconstruction of bridge over Saginaw river, Saginaw, Mich., \$900,000 (100).

Richmond, Fredericksburg & Potomac

Important Work Undertaken: Construction of double-track deck-plate-girder bridge across Aquia creek, Aquia, Va., \$1,045,000 (25). Installation of car retarders on southbound hump, Potomac yard, including necessary grading and revision of track, Potomac, Va., \$915,000 (90).

St. Louis-San Francisco

First Track: Jerome, Mo., to Dixon, 7.11 miles. *Grade Crossing Elimination:* Overcrossings: U. S. Route 60, Wyandotte, Okla., \$150,000 (75). County road, Robertsville, Mo., \$8,000 (25). U. S. Route 271, Cedars, Okla., \$34,000 (75). *Important Work Undertaken:* Second track for eastward traffic, Helm, Mo., to Hancock, 3.14 miles, \$700,000 (60). Revision of alignment and new passing siding, near Arlington, Mo., \$100,000 (100).

Seaboard Air Line

Second Track: Neuse, N. C., to Jeffreys, 1.43 miles. Edgeton, N. C., to Raleigh, 1.06 miles. Panama, Fla., to Jacksonville, 5.07 miles. *Important Work Undertaken:* Passing sidings, 10 locations in Florida, \$160,000 (100). Revision of alignment, McColl, S. C., to Mullins, \$130,000 (100). Replacement of ballast-deck trestle with new trestle, Pee Dee river, near Poston, S. C., \$500,000 (50). Installation of power-operated switches, and extension of 34 passing sidings, P. Oaks, N. C., Lemon Springs and New Hill, \$300,000 (15).

Southern Railway

Grade Crossing Elimination: Overcrossing: Over tracks of Southern and Nashville, Chattanooga & St. Louis, Jones avenue, Atlanta, Ga., \$85,000 (10). *Important Work Undertaken:* Diesel locomotive repair shop, Alexandria, Va., \$297,766 (100). Reconstruction of Pier 2, Charleston, S. C., \$300,000 (100). Replacement of timber trestle over Haw river with reinforced concrete trestle, Reidsville, N. C., \$137,000 (100). Replacement of timber trestle with embankment and construction

of concrete culvert and farm road underpass, Sunbright, Va., \$113,000 (100). Renew steel bridge, including new intermediate pier, over Rapidan river, Rapidan, Va., \$162,000 (100). Filling portion of bridge over Tombigbee river, Jackson, Ala., \$130,500 (30). Replacement of timber trestle with embankment and construction of concrete arch culvert, Cook Springs, Ala., \$120,100 (65). Replacement of timber trestle with embankment and construction of concrete arch culvert, Greavers Hollow, Combs, Tenn., \$199,000 (89). Renewal of steel viaduct using deck girders on new masonry, Accotink creek, Springfield, Va., \$443,000 (40). Replacement of timber trestle with embankment and construction of double concrete arch culvert, Shelbyville, Ky., \$155,800 (10).

Southern Pacific

Grade Crossing Elimination: Overcrossing: Jefferson, Ore., \$50,000 (75). *Important Work Undertaken:* Replacement of bridge over Cache creek, Yolo, Cal., with through pin-truss steel span; includes reinforcement of sub-structure, \$100,000 (25). Installation of additional piles, Great Salt Lake trestle, Utah, \$642,000 (100). Relocation of main track approximately 100 ft. inland from high bluff adjacent to Pacific ocean, Honda, Cal., \$213,000 (100). Replacement of 4 miles of 14-in. wood pipe with 14-in. steel pipe and 5 miles of 6-in. wood pipe with 6-in. Transite pipe, Ancho, N. M., to Pastura, \$100,000 (60).

Southern Pacific Lines in Texas and Louisiana

Important Work Undertaken: Extension of Texas & New Orleans enginehouse, Houston, Tex., \$126,665 (80).

St. Louis Southwestern

Important Work Undertaken: Construction of enginehouse, 125 ft. long, replacing an old round-house, Tyler, Tex., \$175,000 (100).

Terminal Railroad Assn. of St. Louis

Important Work Undertaken: Construction of 12 tracks, total capacity 128 cars, Pickrel yard, St. Louis, Mo., \$160,000 (100). Brick addition to Diesel enginehouse, 2 inspection pits and necessary track changes, at Bremen avenue engine terminal, St. Louis, Mo., \$100,000.00 (100).

Texas & Pacific

Grade Crossing Elimination: Overcrossing: Near Sweetwater, Tex., \$65,000 (100). *Important Work Undertaken:* Construction of concrete and brick enginehouse, machine shop, wash and locker house, El Paso, Tex., \$100,000 (100). Revision of alignment and grade raise, 5.4 miles, near Grand Saline, Tex., \$577,000 (100). Revision of alignment and grade raise, 2.4 miles, near Jefferson, Tex., \$300,000 (10).

Texas Mexican Railway

Important Work Undertaken: Ballast line with crushed limestone, Laredo, Tex., to Corpus Christi, \$550,000 (55).

Union Pacific

Grade Crossing Elimination: Overcrossing: Viaduct over two Union Pacific and one Utah Idaho Central tracks, Hot Springs, Utah, \$100,000 (100). *Important Work Undertaken:* Replacement of boiler washing equipment with electrically operated and modified direct steaming system in enginehouse, Los Angeles, Cal., \$135,379 (100). Drilling of additional artesian well, construction of reinforced concrete reservoir, settling basin and pipe line, construction of pump house, including two booster pumps, fire pump, and incidental equipment, Las Vegas, Nev., \$283,840 (100). Construction of new wye track, 13,000 ft. of additional yard tracks and additional water lines, Huntington, Ore., \$119,646 (100). Construction of new power plant and installation of four boilers, LaGrande, Ore., \$100,000 (100). Centralized traffic control, installation of power-operated switches, and extension of six passing sidings, Las Vegas, Nev., to Caliente, \$1,300,012 (100). Construction of 13.51 miles of new line, replacing 9.37 miles, and raising grade of 1.13 miles of existing line due to Cascade Reservoir, Boise project, Cascade, Idaho, to Donnelly, \$455,027 (25). Centralized traffic control, installation of power-operated switches, and extension of 34 passing sidings, Pocatello, Idaho, to Glenns Ferry, \$2,055,000 (20). Construction of 6,630 ft. of yard tracks and replacement of wood inspection and drop pits with concrete pits, Denver, Colo., \$147,840 (100). Relocation of 1.92 miles of main track, including one grade separation structure, Hermosa Jct., Wyo., \$244,627 (50). Construction of 30,123 ft. of additional yard tracks and replacement of freight house and platforms, trainmaster's office building and engine-men's wash room with one-story freight house and yard office, Laramie, Wyo., \$219,144 (100). Relocation of coaling station and sanding facilities, including construction of two sand towers; relocation

of water cranes and water and sewer lines; construction of enginemen's locker building and 320 ft. of additional track, Rawlins, Wyo., \$213,091 (100).

Union Railroad

Important Work Undertaken: Enlargement of Munhall yard and construction of track scale, Munhall, Pa., \$302,000 (100). Relocation of bridges and viaducts between East Pittsburgh, Pa., and Bessemer, \$2,701,000 (50).

The Virginian

Important Work Undertaken: Addition to and extension of shop and storehouse facilities, Princeton, W. Va., \$425,000 (100).

Wabash

Important Work Undertaken: Revision of alignment and grade reduction, 7.5 miles, Huntsville, Mo., to Clifton, \$458,000 (85). Revision of alignment, 1.53 miles, Stoutsville, Mo., \$178,600 (100).

Western Maryland

Important Work Undertaken: Construction of concrete fender system at coal pier, Port Covington, Baltimore, Md., \$158,000 (50). Construction of 13 ft. wide apron along west side of Pier No. 5, Port Covington, Baltimore, Md., \$180,000 (85). Construction of 1,000-ton coaling station, Maryland Jct., W. Va., \$175,000 (100).

Wheeling & Lake Erie

Important Work Undertaken: New terminal facilities, Cleveland, Ohio, \$332,005 (40).

Canada

Canadian National

First Track: Pointe aux Trembles, Quebec, to Eastern Jct., Montreal, 14.73 miles. *Grade Crossing Elimination:* Overcrossing: Reconstruction of Bridge M.69.7, LaTouche subdivision, Que. (100). *Important Work Undertaken:* Strengthening of steel bridges, M.23.4 and 24.0, over Riviere des Prairies, l'Assomption subdivision, Que. (to be completed in 1946). Construction of electric locomotive repair shop, Montreal, Que. (to be completed in 1946). Construction of 15,000-ton ice house, Montreal, Que. (to be completed in 1946). Construction of passenger car truck repair shop, London East, Ont. (to be completed in 1946). Construction of additional story, main station building, Edmonton, Alta. (to be completed in 1946). Rearrangement of warehouse and track layout, Detroit, Mich. (to be completed in 1946). Replacement of timber breakwater with new cellular-type breakwater at Ferry slip, Muskegon, Mich. (to be completed in 1946). Construction of industrial storage yard adjacent to new assembly plant of General Motors Corp., Flint, Mich. (to be completed in 1946).

Canadian Pacific

Important Work Undertaken: Widening eight bridges to accommodate larger locomotives, St. John and Moosehead subdivisions, \$185,000 (100). Replacement of steel spans on six bridges with heavier spans to accommodate larger locomotives, Mattawamkeag subdivision, \$245,000 (100). Sleeping car and dining car stores building, Glen yard, Montreal, Que., \$260,000 (100). Construction of car repair shop, bunk house, sash house and filter wash house, Glen yard, Montreal, Que., \$500,000 (70). 400-ton silo-type 3-track coaling plant, Lambton yard, Toronto, Ont., \$125,000 (60). Modern passenger station with platforms at new location, with incidental track and roadway changes, Leaside, Toronto, Ont., \$255,320 (45). Widening of embankment and installation of stone ballast, W. Toronto, Ont. to MacTier, 125 miles, \$1,780,000 (10). New boiler house, including two modern boilers equipped with stokers, Chappleau, Ont., \$140,000 (100).

Dominion Atlantic

New Road Under Construction: Diversion of main line from M.P.39.64, Halifax subdivision to M.P.40.51, Halifax subdivision, 0.87 miles. *Important Work Undertaken:* Reinforcement of all timber trestles and eight steel bridges to permit the use of heavier locomotives, Yarmouth subdivision, \$158,600 (95).

Newfoundland Railway

Important Work Undertaken: Construction of enginehouse, machine shop and turntable, locomotive washout shed at engine terminal, St. John's, N. F., \$140,000 (100).

Toronto, Hamilton & Buffalo

Grade Crossing Elimination: Overcrossing: Reconstruction of overhead bridge, Chatham street, Hamilton, Ont., \$33,000 (100).

Railroad Telegraph and Telephone

Saw Big Change

in

1945

IN the railroad telegraph and telephone field, the most important happening during 1945 was the announcement in October that the Western Union Telegraph Company plans to install high-frequency radio relay systems to transmit commercial messages between major cities and the Western Union is to turn over to the railroads all pole lines on railroads which are now owned by the Western Union or jointly with the railroads.

The contracts between the Western Union and the individual railroads vary in most every conceivable manner. For example, on the Chicago & North Western the Western Union owns and maintains the pole line 100 per cent, while on some other roads the ownership is 50-50, or perhaps other percentages. In some instances the Western Union furnished materials for replacements, and the railroad furnished labor, whereas other arrangements are in effect on other roads. Several railroads, such as the Louisville & Nashville and the Chicago, Burlington & Quincy, own all the pole

By **JOHN H. DUNN**

Signals and Communications Editor

lines on their property, and they may or may not now rent pin space or line wire to the Western Union or other communication companies.

Time Pulse Multiplies Channels

During the war rapid advancement was made in the development of high-frequency and micro-frequency radio apparatus so that many more frequency channels are available. The Western Union has applied to the Federal Communications Commission for allocations of channels in the 4,070 to 4,230 megacycle micro-range of the radio spectrum. Not only have more frequencies been made available by the development of high-frequency apparatus but also systems are now available to split each of these high frequencies into timed pulsations, thereby deriving several channels from one high-frequency radio beam.

On September 17 the Federal Telecommunication Laboratories, of the International Telephone & Telegraph Corporation, demonstrated a development known as pulse time modulation whereby 24 or more telephone conversations can be carried on the same radio frequency simultaneously without interfering with each other.

On October 31 the Western Electric Company and the Bell Telephone Laboratories demonstrated the time-pulse system operating at 5,000 megacycles. With 8,000 pulses per second and each pulse lasting one microsecond, eight individual telephone messages or 18 teletype messages can be transmitted simultaneously on one radio beam.

These very high frequencies operate

on a straight line; that is, line of sight, so that towers with repeater stations are required on an average of every 30 miles. The system is said to be so expensive that the costs can be justified only by a considerable volume of message traffic, such as that of the Western Union.

Relay Radio on Rock Island

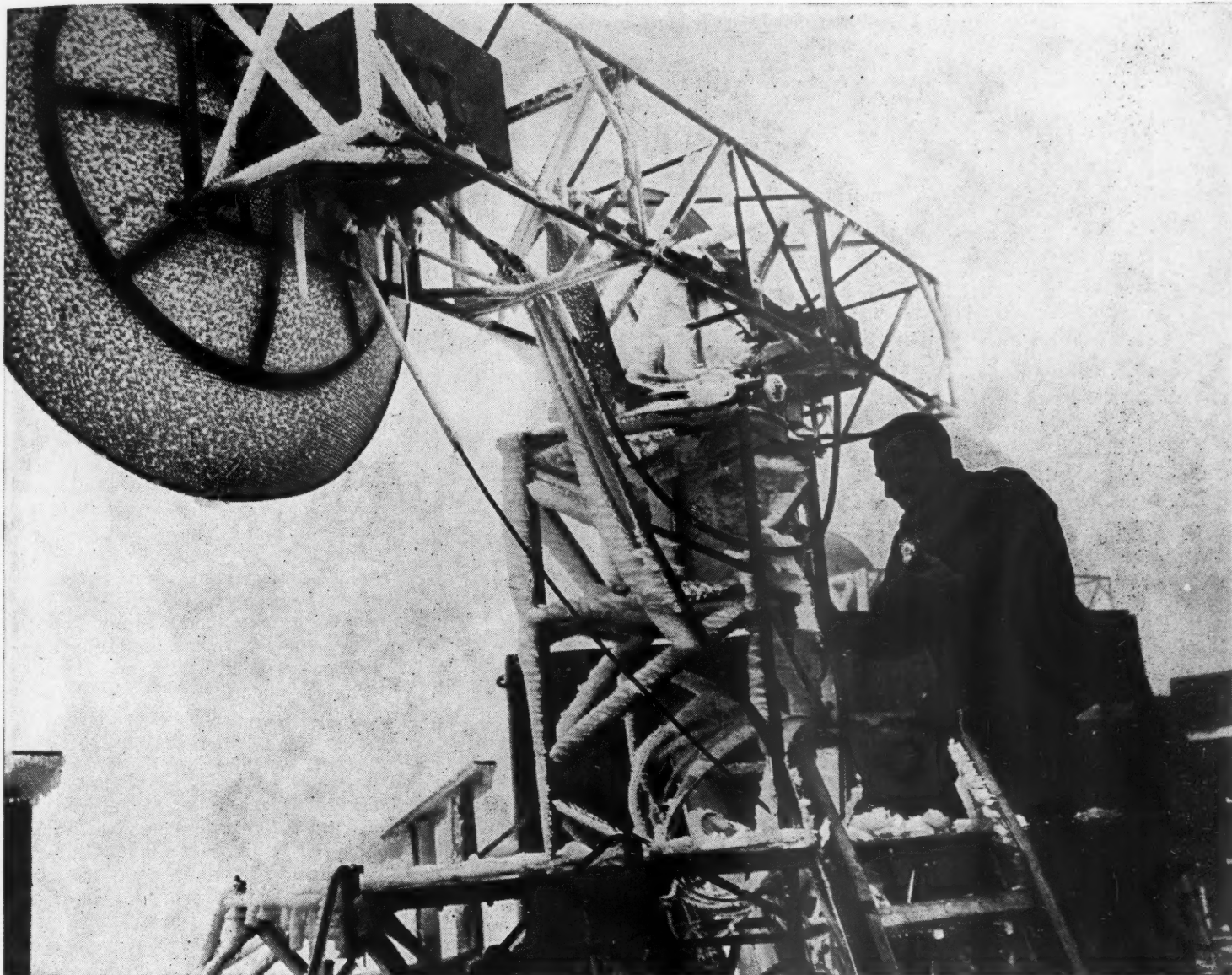
During the latter part of December the Chicago, Rock Island & Pacific installed the first railroad-owned radio relay link. This link operates between Kansas City and Topeka, 70 miles. At Kansas City the antennae is on the Fidelity building, 600 ft. high, and at Topeka on an office building 125 ft. high. The antennae is a six-element di-pole array with three driven radiators, two of which are out of phase, and three are parasitically excited reflectors, thus resulting in highly directional beaming. The equipment operates at 160 megacycle frequency modulation, and the one beam handles three telephone conversations in each direction simultaneously, thus totaling six channels.

The Rock Island has installed four portable radio sets for two-way telephone service, in a range up to about



H. P. Corwith, assistant chief engineer, Western Union, standing by reflector used in super-high frequency beamed radio relay system

Release of war-time developments of micro-frequency radio, using multi-channel time pulse modulation, disrupts previous conceptions of the use of line wires as well as carrier on wires, while Western Union adds to confusion by announcing adoption of these new radio systems, thereby abandoning ownership of pole lines on railroads. Although the Federal Communications Commission has had charge of train communication, a bill presented before the United States Senate on November 9, proposes that the Interstate Commerce Commission is to have jurisdiction over train communication, and all other forms of telegraph and telephone are thrown in, so that the tail may possibly wag the dog.



A heavy sleet did not affect operation of parabolic micro-wave reflectors in United States army service on the Zugspitze, which is the highest mountain in Germany

12 miles, for communication between field construction offices and the foremen in charge of field forces on bridge projects, derricks, ditchers, pile-drivers, snow-plows and other emergency equipment. The sets are each equipped with a bell and red lamp which are operated as calling devices when the station is being called.

Annual Charges Should Be Less

Pole line facilities require constant maintenance and replacements. Boys, both young and old, break insulators by the thousands every year. Poles and cross-arms decay and must be replaced. Copper wire will stretch, crystallize and break. In sleet territories, heavy ice loads break wires and poles for miles. On a medium sized pole line of 40 to 60

wires, the maintenance, repairs, replacements and investment charges of a pole line may average about \$50 to \$60 per year for each pair of wires. In some instances these charges may run up to \$80 or more. The fewer the number of wires, the greater the costs

per wire mile, because the percentage for maintenance of poles may increase. By use of multiplex, phantom, carrier and other means of using wires for two or more messages simultaneously, the charges per channel mile per year may be reduced.

Principal Increases in Communication Plant Facilities on the Railroads in the United States and Canada During 1945, as Compared with 1944 and 1943

	1945	1944	1943
Miles of new or rebuilt pole line:			
Railroad owned	2,383.6	316.0	3,536.1
Commercially owned	1,701.9	2,831.4	2,248.8
Jointly owned	930.7	1,771.4	2,171.6
Totals	5,016.2	4,918.8	7,956.5
Mileage of new copper line wire:			
Railroad owned	5,859.6	5,447.9	1,657.5
Commercially owned	1,105.7	1,589.6	1,965.8
Totals	6,965.3	7,037.5	3,623.3
Gross increase in miles of road dispatched by telephone	2,308.2	2,318.1	672.2
Increase in miles of long-distance telephone circuits	21,581.6	21,178.3	15,461.9
Increase in mileage of printing telegraph circuits	20,195.3	17,068.9	11,980.6
Number of new printing telegraph machines	257.0	140.0	186.0
Increase in circuit miles of new carrier current systems	17,504.5	13,855.6	13,914.8

New and Rebuilt Pole Line Construction and New Line Wire Installations in the United States and Canada During 1945

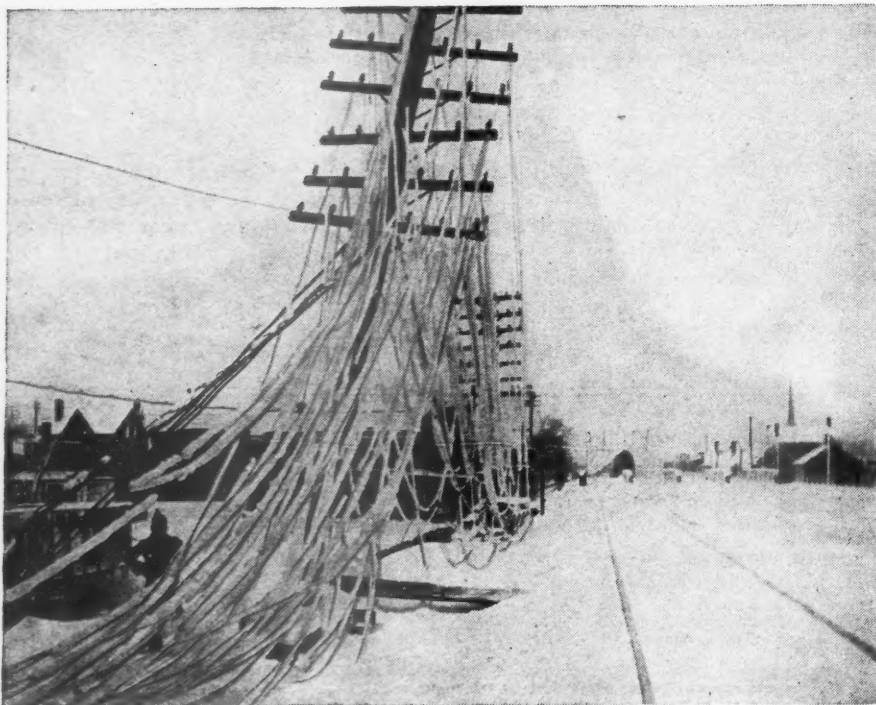
Railroad	New or Rebuilt Pole-Line Mileage			Mileage of New Copper Wire	
	Railroad Owned	Commercially Owned	Jointly Owned	Railroad Owned	Commercially Owned
A. C. L.	.....	.....	.....	.....	494.6
A. T. & S. F.	.....	.....	117.6	660.4	209.0
B. & M.	.....	6.0	.....	14.0	11.8
B. & O.	.....	.....	.....	260.0	.....
C. B. & O.	136.0	.....	7.0	402.0	.....
C. & E. I.	.....	.....	37.0	.....	.....
C. M. St. P. & P.	50.0	.....	.....	375.0	.....
C. N.	.....	.....	449.0	163.0	189.0
C. & O.	287.1	.....	.....	100.0	.....
C. P.	2.0	267.5	.....	264.0	3.0
C. R. I. & P.	75.0	37.0	.....	366.0	.....
C. & S.	.....	7.5	.....	294.8	.....
D. & H.	31.5	1.5	.....	163.0	.....
D. L. & W.	.....	.....	13.2	26.4	26.7
D. M. & I. R.	52.0	.....	.....	.....	.....
E. J. & E.	1.0	.....	.....	.....	.....
Erie	11.8	2.2	121.7	33.4	7.3
G. & F.	17.0	.....	.....	.....	.....
G. N.	437.0	.....	.....	.....	.....
I. C.	59.0	160.0	.....	.....	.....
I. T.	10.0	.....	.....	.....	.....
L. & H.	5.0	.....	.....	2.0	.....
L. & N.	280.0	.....	.....	190.0	.....
L. V.	5.0	.....	.....	.....	.....
Monongahela	5.0	.....	.....	.....	.....
M. P.	.....	257.8	.....	.....	.....
I-G. N.	.....	.....	32.0	230.0	3.0
N. O. T. & M.	.....	.....	18.0	56.0	62.0
St. L. B. & M.	.....	.....	.....	70.0	.....
S. A. U. & G.	64.0	.....	.....	300.0	.....
M. St. P. & S. S. M.	240.0	.....	105.0	.....	.....
N. C. & St. L.	75.0	.....	.....	.....	.....
N. P.	54.0	.....	.....	103.0	1.0
N. S.	45.0	.....	.....	.....	.....
N. & W.	9.0	169.0	.....	18.0	.....
N. Y. C.	8.3	216.0	40.4	258.3	.....
N. Y. C. & St. L.	.....	.....	.....	380.6	.....
N. Y. N. H. & H.	.....	25.0	.....	13.0	.....
P. E.	1.9	.....	.....	11.4	.....
Penna.	397.4	.....	.....	40.5	.....
P. M.	.....	68.5	.....	.....	.....
P. & S.	7.0	.....	.....	8.0	.....
Reading	21.7	25.5	.....	150.2	.....
St. L. S. F.	.....	19.0	.....	.....	.....
S. A. L.	.....	98.4	3.0	184.2	.....
S. I.	6.9	.....	.....	.....	.....
Southern	.....	.....	.....	95.8	.....
G. S. & F.	.....	.....	.....	257.0	.....
S. P.	.....	91.0	.....	140.0	.....
T. & N. O.	.....	13.0	.....	151.0	116.0
U. P.	.....	.....	.....	1.0	.....
Virginian	34.0	.....	.....	36.0	.....
Wabash	.....	71.0	.....	.....	9.0
W. M.	.....	121.0	.....	68.0	.....
W. P.	.....	45.0	.....	.....	.....
Totals	2,428.6	1,701.9	943.9	5,886.0	1,132.4

If a disastrous sleet storm destroys extended sections of the pole line, the charges for that year will be much higher, and, of equal importance, communications are disrupted for considerable time. All these expenses and troubles are avoided by using the new multi-channel time-pulse micro-wave radio which requires only the terminal equipment and repeater stations on towers spaced about 30 miles. Furthermore, the annual cost per channel mile should be far less than for similar charges applying to line wires on pole lines.

Radio Upsets Apple Cart

The development of these time-pulse micro-wave relay radio systems came about so rapidly that several apple carts were rudely upset. Several years ago while working on the basis that there were no more frequencies available in the then known ranges, the so-called "carrier" system was developed in which high frequencies are superimposed on existing telegraph or telephone line wires so that separate telephone conversations or telegraph messages can be transmitted simultaneously over the same wire. For example, a single-channel carrier will handle one circuit over and above the circuits already on the wires, or a three-channel carrier would handle three additional. A six-conductor coaxial cable was developed and installed to a limited extent, by means of which 960 messages can be transmitted at once.

Prior to and during the war, the great demand was to secure and install carrier apparatus, thereby increasing the utilization of existing line wires. For example, in 1944 the railroads added carrier apparatus to derive 13,856 additional circuit miles without adding a foot of line wire. Throughout several years before the war, the principal point of discussion between the railroads and the Western Union had to do with who was going to install how much carrier, and who was going to be stuck with



Sleet storms break down line wires and poles

New Printing Telegraph Placed in Service During 1945

Railroad	Miles of Circuits	No. of Machines
A. T. & S. F.	589.0	20
B. & O.	840.0	32
C. M. St. P. & P.	187.0	2
C. N.	4,015.0	31
C. P.	8,425.0	47
C. R. I. & P.	141.0	3
D. & H.	.....	1
Erie	68.4	4
M. P.	.....	.....
I-G. N.	.....	2
St. L. B. & M.	.....	2
N. Y. C.	98.0	2
N. Y. N. H. & H.	1,011.0	28
Penna.	589.6	12
Reading	.7	6
S. A. L.	1,575.2	30
Southern	.....	4
A. G. S.	152.4	2
N. O. & N. E.	202.1	2
N. O. T.	.....	1
S. P.	568.0	.....
T. & N. O.	825.0	13
U. P.	907.9	13
Totals	20,195.3	257

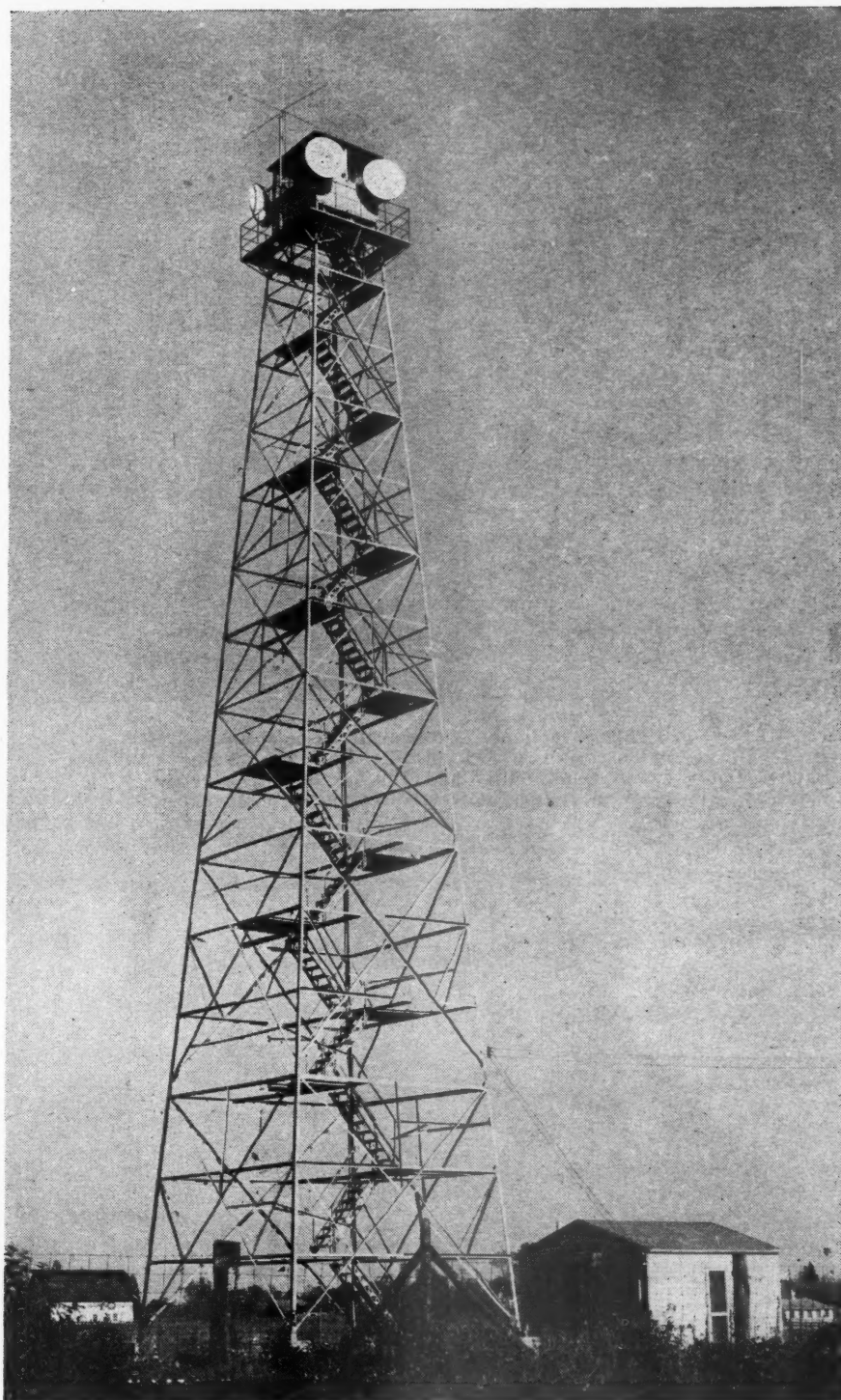
New Mileage of Carrier-Current System Installed During 1945

Railroad	Miles
A. C. L.	110.0
A. T. & S. F.	1,446.2
B. & O.	1,595.0
C. B. & Q.	1,702.0
C. & E.	150.0
C. M. St. P. & P.	1,101.0
C. N.	377.0
C. & O.	159.7
C. P.	4.6
C. R. I. & P.	341.0
D. L. & W.	146.0
I. C.	65.0
L. & N.	172.0
M. P.	199.0
I. G. N.	153.0
N. O. T. & M.	136.0
N. P.	1,960.0
N. Y. C.	790.0
N. Y. N. H. & H.	437.0
Penna.	473.3
St. L. S. F.	636.8
St. L. S. W.	443.0
S. A. L.	1,871.4
Southern	610.1
G. S. & F.	261.7
S. P.	...
T. & N. O.	220.0
T. & P.	590.6
U. P.	1,499.1
Total	17,650.5

the old wires, or who was to install new and better wires for carrier. Then all at once in October, 1945, the Western Union stepped out of the pole line business, all transactions to be closed within seven years. But a railroad must continue the use of pole lines for dispatchers' circuits and local circuits to various offices. No one has yet proposed radio that is practical for all these railroad services. Thus, although the pole lines may be a white elephant to the Western Union, they are of a certain utility value to the railroads, but the wisdom of Solo-

New Mileage of Telephone Train Dispatching and Long-Distance Telephone Circuits Placed in Service in 1945

Railroad	New Miles of Road Dispatched by Telephone	Miles of New Long-Distance Telephone Circuits
A. C. L.	209.5	2,118.4
A. T. & S. F.	...	3,719.0
B. & O.	556.0	1,772.0
C. B. & Q.	141.0	1,452.0
C. M. St. P. & P.	110.0	...
C. N.	14.0	...
C. & O.	8.7	...
C. P.	...	2.0
C. R. I. & P.	134.0	424.0
C. & S.	28.1	119.3
D. L. & W.	...	146.0
D. M. & I. R.	...	79.8
I. C.	...	65.0
L. & N.	45.0	172.0
M. P.	...	...
I. G. N.	268.0	...
N. O. T. & M.	33.0	...
St. L. B. & M.	21.0	...
S. A. U. & G.	186.0	...
N. P.	...	3,584.0
N. Y. C.	...	790.0
Penna.	...	135.0
Reading	...	162.5
St. L. S. F.	...	747.8
S. A. L.	...	1,601.4
Southern	193.0	...
G. S. & F.	261.7	...
S. P.	...	1,178.0
T. & N. O.	...	283.0
T. & P.	...	590.6
U. P.	98.2	2,424.8
W. M.	...	22.0
W. P.	...	139.0
Totals	2,308.2	21,727.0



One of the automatic unattended radio relay towers in the experimental circuit operated by R. C. A. and Western Union between New York and Philadelphia

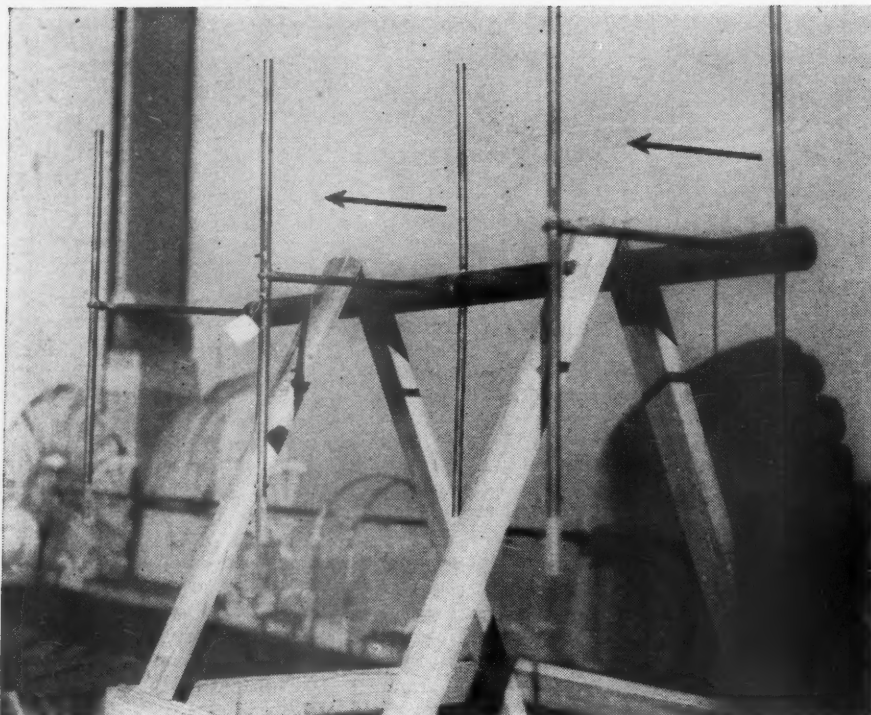
mon may be required to determine a price based on the future usefulness of a pole line to the railroad, rather than a figure based on construction costs now or at some valuation date years ago.

Otherwise Usual Procedure

A considerable number of persons may have known about the new time-pulse micro-wave radio but as a general prop-

osition the railroads, during 1945, proceeded as usual to repair their pole lines and install new line wires as fast as materials could be secured and men employed for field work.

For example, in 1945, approximately 5,016 miles of pole line were built new or reconstructed to the extent that they are as good as new. This figure compares with 4,918 miles in 1944, and 7,956 miles in 1943. In 1945 about 6,960 miles



Highly directional six-element di-pole antennae used in the Rock Island radio relay link between Kansas City and Topeka, 70 miles—Arrows on picture indicate direction of operation



Pole lines will still be needed by railroads where radio is not practicable

of new copper line wire were installed, as compared with 7,037 miles in 1944. Also during 1945 about 2,308 miles of telephone train dispatching was installed, about 21,581 miles of long-distance telephone circuits were installed, and 257 printing telegraph machines were installed for operation on about 20,195 circuit miles. All of these figures are increases above corresponding data for either of the two previous years. Now that war-time restrictions on materials are being relieved, increased programs for pole line reconstruction, additional carrier current equipment and more telephones and telegraph printers are in the making; providing the new radio systems and use of wires abandoned by Western Union does not change the picture entirely.

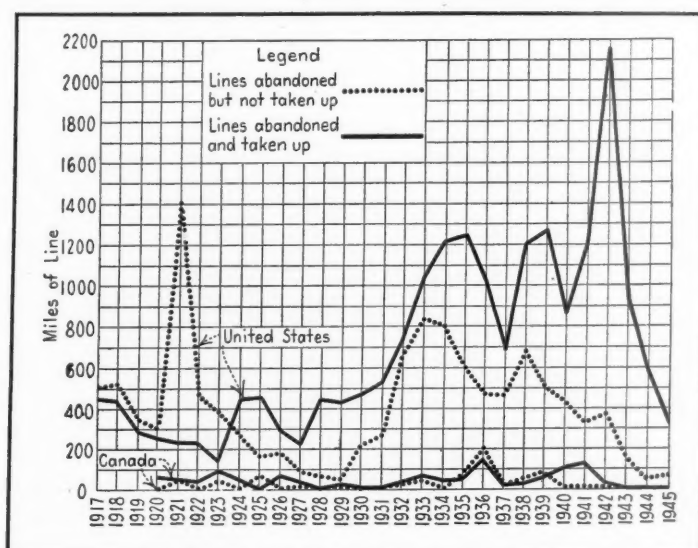
A Proposed Law

On November 9 Senator Wheeler presented bill S. 1537 before the United States Senate which proposed that the Interstate Commerce Commission have jurisdiction over the installation, inspection, maintenance, repair and operation of such facilities as the telegraph, telephone, radio, inductive or other wayside and/or train communication systems.

This proposed law is part of a long series of important actions in 1945 by government bodies, including the Federal Communications Commission, the Interstate Commerce Commission and the United States Senate, all of which are discussed from the standpoint of train communication in an article entitled "Train Communication Gets Squared Away in 1945" elsewhere in this issue. In brief, the jurisdiction over railroad train communication facilities seems to be the bone of contention between the Federal Communications Commission and the Interstate Commerce Commission. But while proposing a law to give the jurisdiction of train communication to the Commerce Commission, the Senate bill includes also all other railroad communications facilities, such as telegraph and telephone. Thus the tail may wag the dog into an unnecessary bureaucratic straightjacket.

Study Indicated

In conclusion, this proposed legislation, the pole line matters and the developments in radio and train communication are all rapidly interjecting problems that require deep study and concerted action on the part of railroad communication officers during 1946.



Abandonments Drop Still Lower

Mileage of lines upon which operation was suspended permanently dropped sharply again in 1945, to become the lowest since 1927

CONTINUING the trend that had its genesis after the record abandonments in 1942, of decreasing mileages of lines abandoned year by year, those recorded for 1945 were the lowest for any year since 1927. In fact, in only one year—1927—since this record was started have the abandonments for any year been less than they were in 1945. Furthermore, there were no abandonments in either Canada or Mexico during the year.

In 1945 a total of 412 miles of lines was abandoned in the United States, compared with 2,516 miles in 1942, 1,096 miles in 1943 and 640 miles in 1944. It is also significant of the trend, now extending over a number of years, that even this small total of mileage abandoned for the year exceeded the total of new lines completed by 347 miles.

Year's Largest Abandonment

There were no large individual abandonments, such as occurred in some years, particularly in 1942 and 1943, when the demand for released rail for military purposes was so insistent. The largest single abandonment in 1945 was that of the Yosemite Valley, between Merced, Cal., and El Portal, at the entrance to Yosemite Park, 77.70 miles; this was also the largest abandonment of an individual line. The second in mag-

By **GEORGE E. BOYD**
Associate Editor

nitude was that portion of the Red River & Gulf, between Long Leaf Junction, La., and Kurthwood, 50 miles. In third place with respect to the mileage involved was the line which the Great Northern abandoned between Arming-ton, Mont., and Neihart, 38.22 miles. The Wilmington, Brunswick & Southern stood fourth in the total mileage abandoned, but was second in size for a whole-line abandonment, between Navassa, N. C., and Southport, 30.22 miles.

Four entire railways were abandoned in 1945, two of which, the Yosemite Valley and the Wilmington, Brunswick & Southern, have already been mentioned. The third in the order of mileage was Marshall, Elysian Fields & Southeastern, between Marshall, Tex., and Elysian Fields, 17.5 miles, while the fourth was the Kane & Elk, extending from East Kane, Pa., to La Mont, 13 miles. Operation on this latter road had been suspended for some time, however, before the formal abandonment took place.

The foregoing list compares with 8 entire roads abandoned in 1944, with 3 in 1943, with 14 in 1942, and with 14 in 1941. Since 17 roads passed out of existence in 1939 and 13 in 1940, a total of 73 roads have disappeared during the

seven-year period ending in 1945. While abandonments are not likely to be on so large a scale in the immediate future as they were in the last decade, that they will continue is evidenced by the fact that several more railroads already have petitions before the Interstate Commerce Commission, or are preparing to present them, looking to the abandonments of their entire lines.

The abandonments that are reported in any year include all lines abandoned permanently during the year, regardless of whether the tracks have been taken up at the end of the year. If the tracks have not been taken up, the lines are not included in the reports for later years when the tracks are actually removed.

Not Recorded Prior to '17

Abandonments were not recorded prior to 1917, primarily because such lines as were abandoned were unimportant, besides which they occurred somewhat sporadically and, generally, in sparsely inhabited country, after exhaustion of the resources which they were constructed to reach. In 1917, however, a total of 942 miles was abandoned permanently, since which time abandonments have ranged annually from 282 miles in 1927 to 2,516 miles in 1942. During the entire 29-year period ending with 1945, a total of 31,385 miles of lines has been abandoned, an average of

Lines Abandoned in the United States, Canada and Mexico in 1945

	Lines abandoned and taken up (miles)	Lines abandoned but not yet taken up (miles)
United States		
Atlantic Coast Line		
Micanopy Junction, Fla., to Micanopy	0.41	3.63
Baltimore & Ohio		
Barton, Ohio, to St. Clairs- ville	3.42	
Boston & Maine		
At Fabyan, N. H.	0.11	
Chesapeake & Ohio		
Graham, W. Va., to Tamroy ..	0.98	
Chicago, Burlington & Quincy		
Mt. Ayr, Iowa, to Grant City, Mo.	21.73	
Chicago, Milwaukee, St. Paul & Pacific		
Dishmans, Wash., to Coeur d' Alene, Idaho	6.04	
At Browns, Iowa	0.81	
Birmingham, Mo., to North- ern Junction, Kansas City, Mo.	4.99	
Northern Junction, Kansas City, Mo., to Suburban Junction	1.34	
Suburban Junction, Kansas City, Mo., to Coburg, Kansas City	2.06	
Chicago, Rock Island & Pa- cific		
Perlee, Iowa, to Eldon	22.69	
Great Northern		
Armington, Mont., to Nei- hart	38.22	
Spokane Bridge, Wash., to McGuire, Idaho	4.53	
Huetter, Idaho, to Atlas ...	2.44	
Huntingdon & Broad Top		
Mountain Railroad & Coal Company		
At Mt. Dallas, Pa.	0.31	
Kane & Elk		
East Kane, Pa., to LaMont ..	13.00	
Kansas City Southern		
Spiro, Okla., to Ft. Smith, Ark.	15.11	
Lehigh Valley		
Lopez, Pa., to Bernice....	3.44	
Little Run Jct., Pa., to Slatedale	1.08	
End of Welshtown Branch, Welshtown, Pa.	1.29	
Louisville & Nashville		
Olcott, Ky., to Chenoa ...	1.30	
Marshall, Elysian Fields & Southeastern		
Marshall, Tex., to Elysian Fields	17.50	
Missouri Pacific		
At Bagnell, Mo.	1.66	
Hastings, Neb., to Prosser ..	13.14	
New York Central		
Van Cortlant Park Jct., N. Y., to Getty Sq., Yonkers ..	3.10	
New York, Chicago & St. Louis		
M. P. 365 to M. P. 365.2, Ind.	0.20	
Norfolk & Western		
End of Big Tom's Creek Branch, Va.	1.39	
End of Sand Lick Branch, W. Va.	0.92	
Pacific Coast		
Maple Valley, Wash., to Taylor	8.90	
At Black Diamond, Wash. ...	0.07	
Pennsylvania		
End of Phoenixville Branch, Pa.	0.04	
Reading		
At Boiling Springs, Pa....	0.29	
Auburn, Pa., to Auchenbach ..	15.17	
Rausch Gap, Pa., to Rock- ville	22.36	
Red River & Gulf		
Long Leaf Junction, La., to Kurthwood	50.00	
Texas & Pacific		
Gordon Spur, La., to Sim- mesport	10.84	
Union Pacific		
At Sugar Works Jct., Utah ..	1.02	
Sunset, Utah, to Thatcher... ..	0.61	
Ripple, Colo., to Orcutt ...	2.35	

Mileage Abandoned by States in 1945 and Accumulated Total Since 1931

State	Mileage abandoned in 1945	Accumulated abandonments since 1931 (miles)
Alaska		216.47
Alabama		289.97
Arizona		204.46
Arkansas	2.00	463.67
California	77.70	1,113.70
Colorado	2.35	702.07
Connecticut		129.75
Delaware		37.11
Florida	4.04	639.60
Georgia		516.55
Idaho	9.01	222.94
Illinois		676.60
Indiana	5.03	185.70
Iowa	37.50	879.44
Kansas		850.32
Kentucky	1.30	394.81
Louisiana	60.84	423.71
Maine		211.79
Maryland		96.70
Massachusetts		284.99
Michigan		1,100.23
Minnesota		416.13
Mississippi		299.59
Missouri	17.78	1,062.17
Montana	38.22	151.00
Nebraska	13.14	381.72
Nevada		307.29
New Hampshire	0.11	229.19
New Jersey		217.54
New Mexico		302.13
New York	3.10	609.15
North Carolina	30.20	357.26
North Dakota		23.88
Ohio	3.42	275.23
Oklahoma	13.11	717.98
Oregon		280.02
Pennsylvania	57.91	943.92
Rhode Island		17.39
So. Carolina		341.15
So. Dakota		236.14
Tennessee		480.61
Texas	17.50	1,416.46
Utah	1.63	310.33
Vermont		73.22
Virginia	1.39	407.00
Washington	12.97	343.32
West Virginia	1.90	316.69
Wisconsin		695.61
Wyoming		128.02
Total	412.15	20,980.72

Since the peak abandonments in 1942, aggregating 2,516 miles of main and branch lines, there has been a marked recession in the elimination of rail facilities and this trend bids fair to continue. During the last seven years 73 entire railways have been abandoned, and a total of 31,385 miles of lines have disappeared since 1916. This article gives statistics on total abandonments since 1916, and on abandonments by states since 1931.

Lines Abandoned in the United States, Canada and Mexico in 1945 (Continued)

	Lines abandoned and taken up (miles)	Lines abandoned but not yet taken up (miles)
United States		
Wabash		
Helmer, Ind., to Stroh ...	4.83	
Western Maryland		
Ankeney Mine Spur, Gray, Pa.	0.93	
Wilmington, Brunswick & Southern		
Navassa, N. C., to South- port	30.20	
Yosemite Valley		
Merced, Cal., to M. P. 65 ..		65.00
M. P. 65 to El Portal, Cal. ...	12.70	
Total	337.70	74.45

almost 1,100 miles a year. During the same 29-year period only 10,916 miles of new lines have been constructed, leaving a net decrease of 20,469 in the total railway mileage of the country, an average net reduction of slightly more than 700 miles a year.

Their Distribution

Of equal, but somewhat wider, interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of these abandonments by states and regions, for the states themselves are vitally concerned with respect to the adequacy of transportation within their borders, as well as to the taxable property that is thus lost to them. California had the largest total abandonment in 1945, a total of 78 miles having been eliminated; Louisiana was in second place with 61 miles abandoned; Pennsylvania followed closely with 58 miles; and Montana stood in fourth place with 38 miles abandoned during the year. For the 14-year period ending with 1945 Texas had the largest

Miles of Lines Abandoned in the United States Since 1916

Year	Miles	Year	Miles
1917	942	1932	1,452
1918	959	1933	1,876
1919	637	1934	1,995
1920	536	1935	1,843
1921	1,626	1936	1,523
1922	677	1937	1,140
1923	513	1938	1,897
1924	693	1939	1,783
1925	606	1940	1,299
1926	457	1941	1,509
1927	282	1942	2,516
1928	512	1943	1,096
1929	475	1944	640
1930	694	1945	412
1931	795		

total abandonment, 1,416 miles; California rose from fourth to second place during the year with 1,114 miles abandoned; while Michigan dropped from second to third place, with no lines abandoned in 1945, but 1,100 miles abandoned since 1931; and Missouri fell from third to fourth place with total abandonments of 1,062 miles.

Canadian Abandonments

During the same 14-year period a total of 20,981 miles was abandoned in the United States and Alaska. Of these, 946 miles were in New England; 1,905 miles were in the North Atlantic states; 4,044 miles were in the Southeastern states; 5,461 miles were in the Middle Western states; 1,464 miles were in the Northwestern states; 4,897 miles were in the Southwestern states; and the Rocky Mountain-Pacific Coast states aggregated 2,047 miles.

Since 1932 abandonments in Canada have ranged from 11 to 399 miles, except in 1943, when less than one mile was abandoned, and in 1945 when no lines were abandoned, the aggregate for the 14-year period being 1,177 miles.

GENERAL NEWS

Says Airlines Chief Distorts Its Stand

Transport Association denies
it favors regional mon-
opolies in transport

The Transportation Association of America in a circular has made public a letter to C. R. Smith, chairman of the board of American Air Lines, in which the latter is accused of misrepresenting the position of the Transportation Association. Says the letter to Mr. Smith in part:

"In your address of November 14, 1945, before the annual meeting of the American Petroleum Institute in Chicago, you made some inexcusable misrepresentations with regard to the Transportation Association of America and its aims and purposes, identifying us, at least by inference, with the railroads. They are inexcusable, even if not intended, because, before one discusses and condemns a plan such as ours, one should at least know what it is, and ignorance in such a connection is as much to be condemned as malicious intent.

"You characterize our plan as one for sectional integration leading to monopolies, whereas everything we have uttered, including even the resolution you quote, declares plainly for competitive transportation systems, and there might be as many or as few in any section of the country as conditions justified and as the Interstate Commerce Commission approved.

"In January 1944, this Association published a summary of its eight years of research into all phases of the transportation problem; in January 1945, a supplemental document was issued. Sixty thousand copies of both were distributed to all parties of interest, including the Air Transport Association. We urged careful study—invited suggestions and constructive criticisms. Neither the Air Transport Association nor the individual airlines responded to these requests.

"Now, in November of 1945, in your address at Chicago, you quote from our first research report of January 1944, one paragraph and make no reference whatever to the explanatory and corollary material set forth in the rest of the document. To this you attach an assumption that is completely denied throughout the entire text. Your address is the culmination of a series of such distortions and misrepresentations on the part of the Air Transport Association and some of its members.

"Hoping to accomplish the three-fold objective of (1) preserving private ownership of common-carrier systems, (2) maintaining constructive competition among them, and (3) developing the most efficient services at the lowest rates, we arrive at our recommendation for 'competitive transpor-

tation systems.' Thus, the benefits of government expenditures on the basic facilities of waterways, highways, and airways would supplement the private capital invested in the industry; as a whole; provide for complete transportation services, under common management, utilizing each type of facility in the sphere of its greatest economic usefulness; afford the user the lowest possible rates as a result of the minimum of waste in capital expenditures, duplicated services, discriminatory taxation, unnecessary ticket offices, and excessive overheads.

"Attention is directed to the plain evidence of efficiency, convenience, and minimum costs incident to the application of the principle of common ownership and operation in private transportation. Great industries of the United States own and operate transport facilities of all kinds in direct competition with common carriers. Our studies show that over 30 per cent of the traffic of the country is transported by such private carriers, gathering in their own raw materials, shipping their finished products, providing airplanes, busses, and automobiles for their personnel. Is it your view that this same principle will not work for common carriers? If so, how would you place these two types of transport on a basis of competitive equality?

"We do not question the need for government financing of basic facilities for some time to come. It is evident that private capital is not available for such purposes. The issue is whether national policy is to foster air services without regard to transport services as a whole—whether it is to continue the existing discriminations against the users and investors in surface transportation."

The directors of the Transportation Association at their November meeting have taken action reiterating the Association's opposition to the Saint Lawrence Seaway and advocating repeal of the "commodities clause" of the interstate commerce act.

O. D. T. Ends More Functions

The termination at the end of 1945 of more activities of the Office of Defense Transportation was announced by that agency last week in statements revealing the closing of the division of storage and division of rates. Samuel G. Spear, director of the storage division since November, 1944, has joined the staff of the American Warehouseman's Association after having been in government service since he was assistant to Ralph Budd when the latter was transportation commissioner in the pre-O. D. T. period.

Victor I. Gruber, who had been acting director of the division of rates since October, 1945, after coming with the O. D. T. in 1942, remains in government service, having been appointed to the staff of the war plants disposal division of the Office of Surplus Property.

Canadian Lines Help on Troop Movements

Mead reveals offer to make
cars available; praises
U. S. roads

Following through from the December 21 hearing on the troop transportation situation before the Special Senate Committee to Investigate the National Defense Program, Senator Mead, Democrat of New York, chairman of the committee, issued a December 27 statement revealing that Canadian railroads have promised to assist in the movement home of United States service men returning from the war fronts. At the same time Senator Mead noted reports that the U. S. roads "are putting forth greater effort and working under greater hardships than at any time during the war period," and he added that he wished to commend the carriers for the "magnificent job they are doing."

With respect to the offer of the Canadian roads, the senator said that "immediately after the committee's most recent transportation hearing, Colonel J. Monroe Johnson, director of the Office of Defense Transportation, contacted the Canadian comptroller of transport and received assurances from him that the Canadian railroad lines would make all possible spare cars available for handling American troops. The Canadian officials indicated that they would make every effort to move as many of our troops as they can consistent with their own commitments for the movement of Canadian military forces." Giving his version of testimony at the December 21 hearing, which was reported in the *Railway Age* of December 29, 1945, Senator Mead said:

"The most urgent transportation problem at this time is the movement of servicemen and women who have been arriving at our West Coast ports from the Pacific theaters. During December, the peak arrivals on the West Coast reached 47,000 men per day. The committee has been informed that approximately 130,000 servicemen are now on the West Coast awaiting transportation home. It is estimated that this backlog will be entirely removed during the month of January, 1946. During the past several weeks as many as 26,000 troops a day have been carried by the railroads from the West Coast alone.

"Representatives of the Army, Navy and Office of Defense Transportation have assured the committee that the railroads are making every effort to expedite the demobilization of troops from the West Coast area. At recent public hearings the committee was advised that 90 per cent of the

(Continued on page 125)

Legislative Survey by "Highway Users"

Propaganda group takes look
at political prospect
for coming year

"Eight state legislatures meet in regular session in 1946," says the National Highway Users Conference—an organization which seeks to influence legislation in favor of "highway users," especially operators of large trucks—in a year-end press release. "These states are: Kentucky, Louisiana, Mississippi, New Jersey, New York, Rhode Island, South Carolina and Virginia. It is expected, however, that a number of legislatures in other states will convene in special session to consider methods of speeding up recovery from the effects of the war.

"The Federal-Aid Highway Act of 1944 authorized an expenditure of \$500 million a year for the first three post-war years, to be matched by the states on a 50-50 basis. This authorization is generally referred to as a three-year program, but both federal and state officials recognize that the planning, acquisition of rights-of-way and construction of such a program probably will take more than three years.

"Official spokesmen in some states have indicated that motor vehicle tax increases will be advocated to provide funds for matching federal aid under this program. Preliminary steps are being taken to break down 'highway barriers' through adoption of motor vehicle 'reciprocity' legislation.

"Size and weight limitations will be under consideration in several of the states that meet in 1946. 'Highway Users' all over the nation will focus their attention on the 1946 Kentucky session where determined efforts will be made to liberalize that state's motor vehicle size and weight limitations. Kentucky's restrictions are now the lowest in the nation. Other highway user matters expected to be prominent in 1946 include speed limits, financial responsibility, increased regulation of motor carriers, and highway safety legislation.

"A detailed state-by-state list of prospective legislative issues as reported to National Highway Users Conference follow:

"**Kentucky**—Bills will be introduced to increase sizes and weights and to provide 'reciprocity'; highway commission may insist on right to designate highways that can carry heavier weights. Higher registration fees for all classes of trucks, except those operating in cities, are expected to be advocated.

"**Louisiana**—A gasoline tax increase probably will be proposed. The governor contends additional funds are necessary to match federal aid. An anti-diversion constitutional amendment also may be considered.

"**Massachusetts**—The governor is expected to urge an increase in the gas tax. This proposal was defeated in the last legislature. An anti-diversion constitutional amendment has been proposed for several years but always has been defeated.

"**Mississippi**—Mississippi highway users favor a general downward revision of com-

mercial motor vehicle license fees to make them more nearly comparable with those of other states. A measure will be introduced to provide 18,000 lb. axle weight, gross weight of 45,000 lb. and an increase of length for tractor semi-trailers from 40 to 45 feet. Another proposal will authorize the present Mississippi Committee on Reciprocal Agreements to enter into full 'reciprocity' with other states. The state may have the problem of financing its post-war highway program and a gas tax increase probably may be advocated. A legislative investigating committee has drafted a bill proposing registration fees that are considerably above those of surrounding states.

"**New Jersey**—For the past two years there have been threats of increased registration fees and such a measure may be introduced in 1946. A resolution also may be considered for a study of motor vehicle taxes in the state. Atlantic City's Planning and Improvement Association has considered the possibility of assessing tolls on all motor vehicles entering Atlantic City. A 1-cent gas tax increase is likely to be proposed.

"**New York**—Compulsory inspection of motor vehicles has been under consideration for several years and likely will be introduced in 1946. A perennial favorite New York proposal is the requirement that all trucks and trailers be equipped with rear bumpers of the same heights as those of passenger cars. Thus far it has failed to receive serious consideration but probably will make its appearance in 1946.

"**South Carolina**—Proposals have been made for several years for taxation of trucks delivering goods in cities in which they do not have a regularly established place of business. This might take the form of a state tax on such trucks or permit the various municipalities to levy such taxes. Such a move may be proposed in the next session.

"**Virginia**—Attempts may be made to increase the gross weight limit of 40,000 lb. more nearly in line with those of North and South Carolina. Registration fees probably will be an issue. The governor's cancellation of 'reciprocity' on its 2 per cent gross receipts tax may result in retaliation by neighboring states, and the entire subject of 'reciprocity' will be an issue."

Southern Officer Honored

W. F. Kusch, manager dining cars, Southern Railway System, Washington, D. C., was elected president of the Association of American Railroad Dining Car Officers at its recent 45th annual meeting, in Chicago.

Southern Grain Rate Changes Further Postponed

Upon request of southern carriers, the Interstate Commerce Commission has again postponed the effective date of its order making certain adjustments in proportional and combination rates on grain and grain products to the South, so that it will become effective, unless otherwise directed, on 30 days' notice on May 1, instead of February 1, as previously ordered. The decision prescribing adjustments in the rates was in No. 17000, Part 7-A, I. & S. No. 4208, and related proceedings, as reported in *Railway Age* of April 14, 1945, page 671.

Attack "Political Juggling" of Rates

Mace of N. Y. commerce group
attacks Dixie campaign
in comparative rates

The Commerce and Industry Association of New York has issued a pamphlet entitled "Don't Monkey With Freight Rates" in which it is contended that the "hullabaloo" raised by "the Southern Governors' Conference and other southern politicians over the freight rate structure is based upon a misconception of the facts." The author of the pamphlet is George E. Mace, manager of the Association's transportation bureau.

"The Interstate Commerce Commission was induced to conduct a lengthy investigation into the matter," the pamphlet goes on to say, "and several bills were introduced in Congress, the object of which was to reduce southern freight rates where they exceeded those of the North. An active campaign of addresses before public gatherings, as well as newspaper and magazine articles was conducted.

"The result of all these things has been to convince many people that the freight rates paid by southern shippers are approximately 39 per cent higher than are the freight rates of the north. While this is contrary to fact, the southern politicians have pleaded for a parity of freight rates mile for mile with those existing in the north.

"The object of the campaign, as stated by the southern governors, is to build up the industrial growth of the South. This, of course, could only be done by inducing northern industry to relocate south of the Mason-Dixon line. Thus the South's gain would become the North's loss.

"The populous north is the market for manufactured products. The South has little complaint against the transportation rates within the South but is chiefly concerned with the transportation rates on manufactured products from the South to the Northern markets. Little consideration seems to have been given by the Southern governors to the obvious fact that should they be successful in draining the North of its industries and having them transplanted in the South, they would at the same time reduce or destroy the ability of the North to purchase their products. This is so because the purchasing power created by industrial employment in the North would be depleted. In that respect the southern politicians seem to be advocating decapitation as a cure for a headache. No one will dispute the competence of the cure but those who give it any real thought will agree that the cure is worse than the disease.

"To what extent are the contentions of the Southern politicians meritorious? The first fact that comes to attention is that the South has been growing industrially faster than the country as a whole. This is admitted, and in fact emphasized, by the industrial promoters of the South, who state in the 1944 edition of their 'Blue Book of Southern Progress' that since the turn of the century the value of manufactures in

Congressman Warns of Transport Socialization Threat

"We must make the services provided by private capital continue to be available to the users of transportation when they must compete with the billions of tax-free, interest-free, government capital in other facilities. If we cannot solve this problem, we must face the alternative. That alternative is not pleasant. If you examine the history of countries that have gone over to socialism, you will see what I mean. The first step is the socialization of transportation and communication. We see in England today that almost first on the program of the new socialistic government is the nationalization of transport. A few days after the government took over the banks, it took over domestic airlines. I warn you that what is happening in England can happen and will happen here if privately-financed transportation goes bankrupt in its unequal competitive race with government-aided transport.

"But this fine record [i. e., that of the war period] will amount to nothing as an argument against government operation if we do not compose the potentially destructive elements of transportation into a serviceable tool. The job will not be an easy one, for part of this implement will be supported by private capital which must earn a return. Part of it will be supported by government capital that does not have to earn a return to investors; the taxpayers provide this capital. It is a problem similar to that which faced this nation when half of it was slave and half of it free. I am optimistic enough to believe that we can find the answer without going through the throes of a socialistic revolution.

"Search for this answer we will. Searching for it we are."

—Congressman Owen Harris (Member, Committee on Interstate Commerce), in an address to the Fruit & Vegetable Assn., New York, December 12

the South has increased 700 per cent, while during the same period the national gain was 400 per cent, with states outside the South registering an increase of approximately 366 per cent.

"The Governor of Georgia has become particularly active in the freight rate controversy for reasons best known to himself. Let us take a look at the industrial development of his state and see to what extent the freight rate structure is responsible for its ailments, if any.

"If the politicians of the South were correct in their contention that the freight rates are strangling its industrial development, it would be but natural to assume that the industries located in the South would be solidly behind them in their fight for a change. The exact opposite is the fact!

"In recent proceedings before the Interstate Commerce Commission, a witness located in Birmingham, Alabama, testified on behalf of sixty shippers who are either small or at least not large. The substance of his testimony was that any revision of the freight rate structure would be definitely harmful to the South.

"Various industrial interests engaged in the production of both low-grade and high-grade articles located in Tennessee and elsewhere pooled their testimony through one witness. His theme was that if the freight rates were changed as advocated by the Southern Governors Conference, serious harm would be done to Southern industry.

"Anyone familiar with what has been going on in the North knows that the textile industry at Fall River and New Bedford, Massachusetts, has moved to the South in an alarming degree. Also that the furniture industry, formerly located at Jamestown, New York, has been unable to stand up under Southern competition. During the past twenty years, twenty-two furniture manufacturing concerns in the vicinity of Jamestown have gone out of business.

"These illustrations demonstrate that the freight rate structure has not successfully been rigged up by the North to feather its

own nest at the expense of the South.

"Included in this southern industrial expansion program is an assembly plant to be constructed in the State of Georgia by General Motors Corporation at an estimated cost of 6½ million dollars. Apparently Governor Arnall has not informed General Motors that freight rates have been unlawfully established so as to prohibit industry in the State of Georgia from expanding, which is the text of the anti-trust suit he has brought against the railroads in the Supreme Court of the United States.

"The keeping alive and fanning of the flames of sectional feeling may be an effective way for the southern politicians to perpetuate themselves in public office, but it certainly is not in the public interest, nor is it justification for political juggling of the freight rate structure."

O. D. T. Gives Data on Highway Operations in War

Publication of a 351-page report, entitled "A Review of Highway Transport and Transit Industries During the War," has been announced by the Office of Defense Transportation. The document was compiled in the O. D. T. Highway Transport Department under the supervision of James O. Riley, chief of its inventory and statistics section.

The bulk of the report is devoted to tables setting forth, by vocational uses, information as to certificates of war necessity issued, equipment, mileage, and fuel certified to bus and truck operators during the war, and analyses and explanations of the statistical material. It includes also a review of the war-time conditions faced by the industry and the conservation measures prescribed by the O. D. T. and other government agencies.

According to this study, about 9 billion tons of freight was "carried" in 1941 by all domestic transportation agencies, including about 4 billion tons in "inter-city" service or by inter-city agencies, and some 5 billion tons in local service, the latter figure being stated as a rough estimate only. In that

year, the report indicates, about 16 per cent of the total tons moved in inter-city service was handled by truck, or, because of the relatively shorter hauls in motor operations, about 7 per cent of the total ton-miles handled in inter-city movements. Although less mileage was run by trucks in inter-city service during the war period, tons carried were reported, in terms of 1941 totals, as 107.4 per cent for 1942, 119.2 per cent for 1943, and 119.4 per cent for 1944.

W. S. A.'s "Temporary" Carrier Status Extended 6 Mos.

On application of the War Shipping Administration, the Interstate Commerce Commission has extended for a further period of six months, that is, until June 30, unless sooner modified or set aside, the "temporary" authority granted that agency on September 17, 1945, to operate as a common or contract carrier by water in coastwise or intercoastal service between points on the Atlantic, Gulf of Mexico, and Pacific coasts. Such service is to be performed by holders of certificates or permits for the performance of the service involved, not now engaged in operation due to war-caused conditions beyond their control, who are to act as W. S. A. agents.

The order is in the commission's No. W-926 Sub. 1 TA proceedings. As noted in *Railway Age* of September 22, 1945, page 497, the initial granting of the "temporary" authority to this federal agency was opposed by the Association of American Railroads on the ground that it would result, in effect, in an operation protected against loss by government guarantee and in competition with the railroads.

Car Service Orders

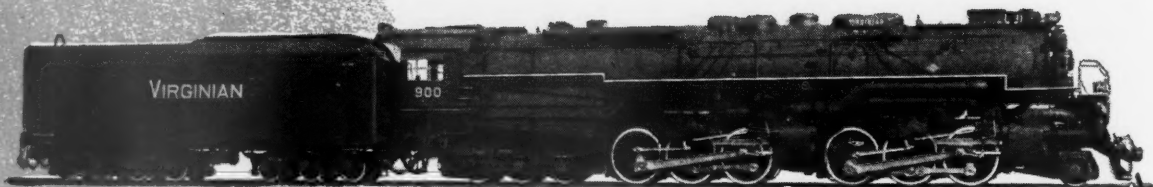
Further modification of Interstate Commerce Commission Agent King's Order No. 7, authorizing railroads in specified states to reroute freight by the most available route when severe weather creates congestion, has been made by the third amended version of that order, effective December 27, 1945, to March 1, 1946, adding to the territory affected the states of Arkansas, Iowa, Kansas, Louisiana, Missouri, Minnesota, Nebraska, North Dakota, Oklahoma, South Dakota, Tennessee and Wisconsin, and including the entire state of Michigan rather than only the lower peninsula. (Previous item in *Railway Age* of December 29, 1945, page 1063.)

The commission has issued a new order, Service Order No. 422, which in effect reinstates the requirements of No. 368, requiring railroads that have the "duty, responsibility or obligation to unload freight," at any point, "including ports," to unload all freight held in box cars 10 days from date of arrival at such points. The order was issued, it was stated, because the shortage of box cars is being contributed to by railroads holding such cars an "unreasonable length of time." It will go into effect January 5 and run through March 15, unless otherwise directed, and applies to interstate, intrastate and foreign commerce.

A number of service orders reinstating or inaugurating embargoes on the acceptance of outbound l. c. l. freight at various mid-western points affected by strikes stopping truckers' operations have been issued by the commission, effective December 29,

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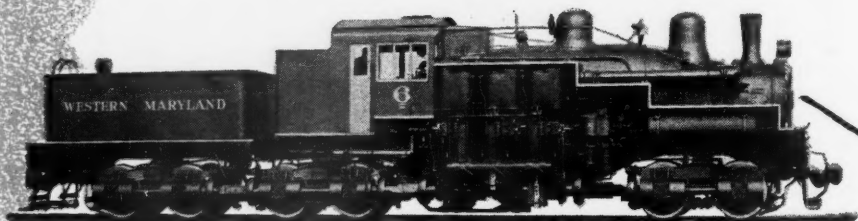
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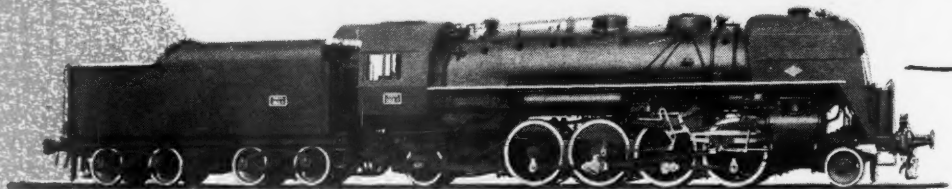
2-6-6-6 Type Locomotives THE VIRGINIAN RAILWAY COMPANY



2-8-4 Type Locomotives THE CHESAPEAKE AND OHIO RAILWAY COMPANY



Shay Type Locomotive WESTERN MARYLAND RAILWAY COMPANY



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1945, and expiring at various dates, subject to other order or modification. No. 417, expiring January 6, applied to the Atchison, Topeka & Santa Fe; Chicago, Burlington & Quincy; Chicago, Rock Island & Pacific; Missouri Pacific; Union Pacific, and Washash at Kansas City, Mo.-Kan., except where freight was loaded by shipper and not handled through railroad freight houses, and except perishables.

Service Order No. 420, running through January 7, established such an embargo, except where loading is by shipper and not through a railroad freight house, on outbound l. c. l. at Chicago, applying to the Chicago, Burlington & Quincy; Chicago & North Western; Chicago, Milwaukee, St. Paul & Pacific; Chicago, Rock Island & Pacific; Illinois Central, and Atchison, Topeka & Santa Fe. No. 423, similarly excepting shipper loading not through freight houses, and effective through January 14, applies to all roads serving Des Moines, Iowa. The same exception applies in No. 424, effective through January 10, which affects the Chicago, Milwaukee, St. Paul & Pacific and the Chicago, St. Paul, Minneapolis & Omaha at Minneapolis, Minn., St. Paul and Minnesota Transfer.

The commission has extended through June 30 the expiration date of its Service Order No. 354, by Amendment No. 2 thereto, thus authorizing the rerouting of traffic routed via the Toledo, Peoria & Western, on account of a strike which has led that carrier to suspend operations.

Consent Decree in Allied Van Lines Anti-trust Case

Attorney General Clark announced December 28 the entry on that day, by the United States District Court at Chicago, of a consent decree in the anti-trust case against Allied Van Lines, Inc., the National Furniture Warehousemen's Association, and approximately 550 warehouse and trucking companies, members of the association. The case was pending nearly two years, the complaint having been filed in January, 1944.

As the Department of Justice announcement put it, the decree requires the association to divest itself of all control or ownership in Allied within six months, cancels the contracts between Allied and its members, eliminates restrictions on the operations of the individual carriers and warehouse companies and permanently enjoins the defendants from agreeing upon or adhering to charges, rules, or regulations for the transportation of household goods and accessory services performed in connection with such transportation.

"Previous practices of limiting competition in services, allocating traffic, boycotting non-member carriers and prescribing rules for the conduct of transportation by individual carriers and warehousemen are also condemned by the decree," the announcement added. It also stated that the decree provides that jurisdiction shall be retained for the purpose of granting further relief including the "possible dissolution" of Allied "in the event that the effects of the practices charged by the complaint are not dissipated after the entry of the decree."

As noted in the *Railway Age* of December 28, 1945, the Interstate Commerce Commission recently received from Examiner

Philip N. Crowley a proposed report recommending commission approval of a proposed new Allied set-up which contemplates transfer of control from the association to more than 300 Allied agents, who would in turn sell their interstate operating right to Allied. Elimination of "any question of violation of the antitrust laws" was listed by the examiner as one advantage of the proposed new set-up.

Army Winds up Its War Freight Consolidation Service

Operation of the Army-Navy Consolidating stations for handling l.c.l. freight shipments will be terminated February 1, the War Department announced last week. This service was started in July, 1942, and since that time has handled for the Army, Navy, Marine Corps and Coast Guard some 2,500,000 tons, or 150,000 carloads of "highly essential" freight, it was stated. An integrated system of six consolidating stations in eastern and midwestern producing sections and nine distributing agencies, most of them on the West coast, was developed to obtain closer control of the movements of merchandise traffic for the armed forces.

The consolidating stations at Cleveland, Ohio, San Antonio, Tex., and St. Louis, Mo., were closed November 1, 1945; those at Philadelphia, Pa., and New York are scheduled to close January 15, and the Chicago station will cease operations February 1. The distributing agencies at Atlanta, Ga., El Paso, Tex., San Francisco, Cal., and Tacoma, Wash., were discontinued November 1, 1945; the Spokane, Wash., agency ceased operations December 7, 1945; and the Portland, Ore., agency on December 31, 1945. The three remaining distributing agencies, at Seattle, Wash., and Oakland, Cal., and Los Angeles, are scheduled for February 1 closing. After that date War Department l.c.l. shipments will be handled through ordinary commercial channels, it was explained.

Freight Car Loadings

Loadings of revenue freight for the week ended December 29 were not available when this issue of *Railway Age* went to press. The total loadings for the week ended December 22, as compiled by the Association of American Railroads, were 688,300 cars. This was a decrease below the corresponding week in 1944 of 74,672 cars, or 9.8 per cent, but an increase above the same week in 1943 of 47,264 cars or 7.4 per cent. Loading of revenue freight for the week of December 22, decreased 83,294 cars, or 10.8 per cent below the preceding week.

Miscellaneous freight loading totaled 308,635 cars, a decrease of 33,718 cars below the preceding week, and a decrease of 67,732 cars below the corresponding week in 1944. Loading of l. c. l. totaled 105,239 cars, a decrease of 11,433 cars below the preceding week but an increase of 4,410 cars above the corresponding week in 1944. Coal loading amounted to 157,908 cars, a decrease of 22,787 cars below the preceding week, but an increase of 860 cars above the corresponding week in 1944.

Grain and grain products loading totaled 45,786 cars, a decrease of 8,727 cars below the preceding week and a decrease of 303 cars below the corresponding week in 1944.

Livestock loading amounted to 17,007 cars, a decrease of 4,082 cars below the preceding week but an increase of 1,668 cars above the corresponding week in 1944.

Forest products loading totaled 31,090 cars, a decrease of 1,980 cars below the preceding week and a decrease of 10,455 cars below the corresponding week in 1944. Ore loading amounted to 9,632 cars, a decrease of 342 cars below the preceding week and a decrease of 2,403 cars below the corresponding week in 1944. Coke loading amounted to 13,003 cars, a decrease of 225 cars below the preceding week, and a decrease of 717 cars below the corresponding week in 1944.

All districts reported decreases compared with the corresponding week in 1944 except the Pocahontas. All reported increases compared with 1943 except the Southwestern.

Collision at Interlocking Ascribed to Main Failure

A side collision 1.42 miles west of Clarksburg, W. Va., on the main line of the Baltimore & Ohio to Cincinnati, which occurred at 1:13 a.m. on September 5, 1945, resulted, according to the report of an investigation conducted by the Interstate Commerce Commission under the supervision of Commissioner Patterson, from the failure of an engineer to control the speed of his train as required by an interlocking signal indication.

The accident occurred at the end of double track west of Clarksburg, and involved a 5-car eastbound passenger train, Extra 5113, and the westbound "National Limited," made up of 13 cars and a 2-unit Diesel-electric locomotive. There were no fatalities, but 26 passengers and 6 employees were injured.

Trains in the vicinity were operated by signal indications, if moving with the current of traffic, as those involved were. The eastbound train's movement into the double-track section was controlled by an automatic signal 1.35 miles west of the point of the accident and by a semi-automatic signal 1,066 ft. west of that point. The westbound train's movement from the westward double track to the single track section was controlled by semi-automatic signals located 2,951 ft. and 82 ft., respectively, east of the point of the accident. All signals involved were of the color-position-light type, approach lighted, and all were found after the collision to have been working properly. The accident occurred within interlocking limits, where train movements were subject to the control of the operator of J Tower, located 0.72 mile east of the collision point.

The eastbound train was moving through the switch from single track into the eastward double track when it was struck by the westbound train. The signals and switch had been lined for this eastbound movement, and a derail of the lift-block type was in derail position on the westward track. The more distant signal controlling the westbound train was just west of the point where that train had stopped at the Clarksburg station, and was displaying an approach aspect (white over two yellow lights in diagonal position to the right), which required a train passing it to be prepared to stop short of the next signal.

Both the engine crew and train crew of the National Limited observed the approach aspect of the signal at Clarksburg, but the engineer asserted that after he had started westward, but before he passed the signal, he thought its indication changed to proceed. He called this indication to the "fireman" and opened the controller further. The fireman acknowledged the proceed indication, but he did not observe the signal as he was engaged in other duties.

The speed of the westbound train had reached 29 m.p.h. when, as it was approaching the interlocking tower, the fireman observed the signal beyond, near the fouling point of the merging main tracks, displaying a stop aspect. He called this indication several times, but the engineer did not respond, testifying later that he did not hear it. When the train neared the tower, the engineer did see the operator giving stop signals with a red lantern, and he made a brake application. He asserted he applied the brakes in emergency, but they did not respond. Other members of the crew were of the opinion that a service application had been made. The speed of the train was reduced from 29 m.p.h. to 27 m.p.h., according to the speed recorder tape, within a distance of about 600 ft. immediately east of the collision point. Tests of the brakes made after the accident disclosed no condition to prevent their proper application.

The derail was torn loose by the westbound train. The second to fifth cars, inclusive, of the eastbound extra were derailed and badly damaged; the locomotive units and first three cars of the westbound train were derailed and more or less damaged, the front end of the first Diesel unit being badly damaged.

Refuses to Put Truck Rights on "Grandfather" Basis

Reporting on reconsideration in a case involving the Missouri Pacific's operating rights on 11 truck routes between points in Kansas, Missouri, and Nebraska, the Interstate Commerce Commission has denied that road's application for issuance of a certificate under the Motor Carrier Act's "grandfather" clause in lieu of the present certificate issued on the basis of a showing of public convenience and necessity. The proceeding is docketed as No. MC-44609.

A "grandfather" clause certificate was denied in the prior report by the commission's Division 5 on the basis of a finding that the operations involved had been conducted under contracts with independent truckers, and the M. P.'s arrangements with such truckers did not on the "grandfather" date (June 1, 1935) meet the requirements of control and responsibility laid down in the Dixie-Ohio case. Meanwhile, the division did issue the present certificate on the road's showing of public convenience and necessity.

The reconsideration was sought by the M. P. following the Supreme Court's January 17, 1944, decision in *Thompson v. United States*, 321 U. S. 19, which reversed a commission decision and ordered that the Chicago & North Western be issued "grandfather" certificate covering routes which had been operated for it by independent truckers under contract.

In refusing to change the basis of the

M. P. certificate, the commission stated that any "grandfather" rights to which the applicant would be entitled would authorize operations no greater in scope than those now covered by the present certificate. Under such circumstances the issuance of the "grandfather" certificate sought would be "a useless procedure," the report added. Commissioner Miller, dissenting in part, thought the M. P. was "fully entitled" to a "grandfather" certificate.

Canadian Lines Help on Troop Movements

(Continued from page 121)

railroad passenger service from West to East is being utilized in the movement of troops, and 72 per cent of all the Pullman cars in America are allocated to the military. The committee was further advised that during the holiday season the movement by rail of some 40,000 prisoners of war and approximately 15,000 Mexican laborers would be discontinued in order to make more passenger space available for the demobilization of troops. In addition, new troop sleeping cars at the rate of 23 a day are being fed into the military stream.

"Colonel Johnson pointed out to the committee that another problem which may further burden our already overtaxed railroad facilities is the fact that freight cargoes ordinarily carried by coastwise ocean freighters may be turned over to the railroads for handling, inasmuch as there is a critical shortage of crews for these merchant vessels. Hearings were recently held on the subject of ocean transportation and it was ascertained that approximately 10,000 merchant seamen are now being held on idle cargo ships in the far Pacific. War and Navy Department representatives have advised the committee that efforts will be made to return these idle ships and crews to the United States in order to ease our transportation difficulties.

"At the committee's public hearings it was brought out by Colonel Johnson that commercial and military air transportation was able to carry only a small percentage of the troops from the West Coast area. Several weeks ago the commercial airlines advised the Office of Defense Transportation that they would give up 70 per cent of their passenger space and would increase the number of their transcontinental trips in an effort to carry 100,000 troops per month by air. However, the air transportation facilities have not been able to accommodate troops at a rate of more than 53,000 per month, due to shortages of personnel and equipment, and because of weather conditions."

Equipment Depreciation Rates

Equipment depreciation rates for the Bangor & Aroostook, the Akron, Canton & Youngstown and the Cincinnati, New Orleans & Texas Pacific are among those prescribed by the Interstate Commerce Commission in a new series of sub-orders in the general proceeding, Depreciation Rates for Equipment of Steam Railroad Companies. The total ledger value of all equipment of the three companies named is given, respec-

tively, as \$10,435,840; \$2,070,286 (also \$828,736 leased); and \$28,283,379.

For the Bangor & Aroostook the depreciation rates prescribed in sub-order 270-B are: Steam locomotives 3.08 per cent; steel freight cars, 3.81 per cent; cabooses, 2.72 per cent; steel passenger train cars, 3.09 per cent; work equipment, 3.38 per cent; and miscellaneous equipment, 20.0 per cent.

For the A. C. & Y. the rates prescribed in sub-order 731, the initial order for this company following reorganization, are: Steam locomotives, 3.21 per cent; other locomotives, 3.88 per cent; owned freight cars, 4.42 per cent; passenger train cars, 6.04 per cent; work equipment, 4.11 per cent; and miscellaneous equipment, 15.13 per cent.

For the C. N. O. & T. P. the rates prescribed in sub-order 99-A are: Steam locomotives, 3.01 per cent; Diesel road locomotives, 6.60 per cent; Diesel switching locomotives, 3.96 per cent; 44-ton Diesel switching locomotives, 4.95 per cent; freight cars, 3.73 per cent; passenger train cars, 2.81 per cent; work equipment, 4.19 per cent, and miscellaneous equipment, 10.0 per cent.

Short Line Association Board Holds Meeting

J. M. Hood, president of the American Short Line Railroad Association, and all other officers were reelected at a December 17, 1945, meeting of the association's board of directors in Chicago.

The board also authorized various 1946 activities, including submission of a freight car per diem formula to the Interstate Commerce Commission's Bureau of Transport Economics and Statistics; a petition to the I. C. C. for modification of the A-B brake order; intervention by the association in the Department of Justice's proceedings against the South Buffalo under the commodities clause; contribution of \$1,000 to the Joseph B. Eastman Foundation; and support of the National St. Lawrence Project Conference.

The association's legislative program was reaffirmed for 1946 in the same language as applicable to 1945, except the call for repeal of land-grant rates which has already been accomplished. October 2 and 3 were set as the dates of the 1946 annual meeting to be held at the Morrison Hotel, Chicago.

Injunction Granted Against Class Rate Changes

As briefly noted in last week's *Railway Age*, the three-judge court which heard the plea of nine eastern states for a temporary injunction against the order of the Interstate Commerce Commission ordering an increase in Eastern class rates and reductions in those of the West and South granted the injunction; so the I. C. C. had to get busy with short-notice authority to the railroads to suspend the new tariffs which were to have gone into effect on January 1.

In granting the temporary injunction, the court said:

"There are reasonable grounds for believing that the reports and orders of this Commission may be erroneous, contrary and without adequate support in the evidence, and should be permanently annulled and their enforcement enjoined. This can-

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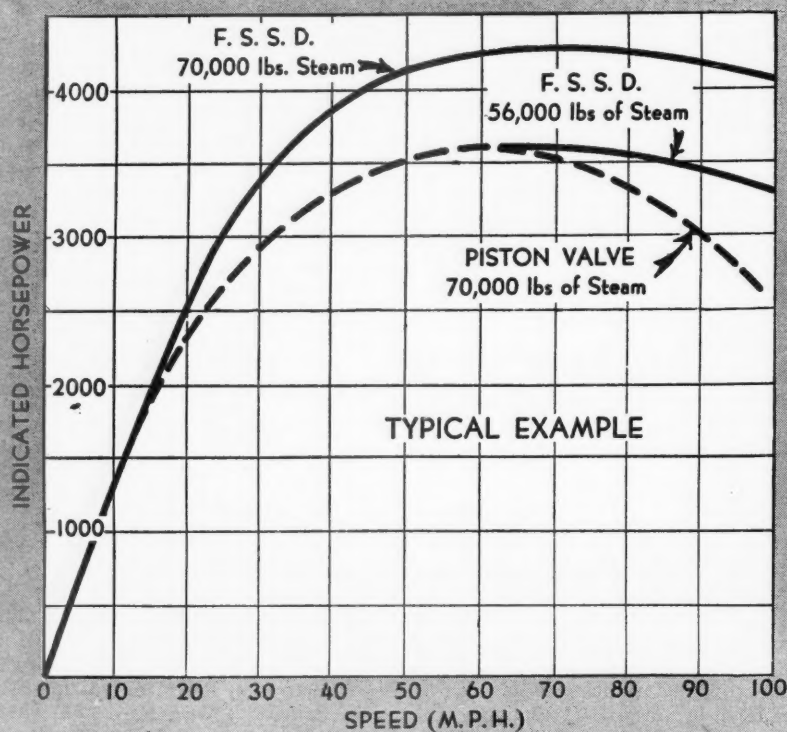
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not, however, be determined until final hearing and upon examination of the evidence before the Commission which will then be before the court."

The court said that there was greater justification for continuing temporarily the present class rates than for permitting a sudden change in rates required by the new order, the validity of which was "open to question."

As to the increase ordered in Eastern class rates the court said:

"A 10 per cent increase in these class rates would impose upon industry, shippers and receivers of freight transported within official territory an increased cost of many million dollars a year.

"The 10 per cent increase, if required, and permitted to be charged by the railroads for transportation within official territory pending final determination of this suit, would subject industries, shippers and receivers of freight and the cities and communities of the States to great injury, for which they will have no redress in the event the commission's orders should finally be held invalid and permanently enjoined. . . .

"The increased charges on shipments of class rate will increase the cost to industry of shipping and receiving their products, will increase the cost of products to consumers, will discourage production and conversion to peacetime operation, and will tend to cause unemployment and consequent local distress.

"Greater disturbance and confusion would result if the changed rates ordered by the commission should be permitted to go into effect and the commission's order should thereafter be held to be invalid and enjoined."

The court issuing the order is composed of Circuit Judge Harrie B. Chase and District Judges Stephan W. Brennan and John C. Knox, and sits in Utica, N. Y., where the states in opposition filed their petition. It is expected that hearings on a further suspension or rejection of the rate order will begin early in the new year.

Signs Deficiency Appropriation

By attaching his signature on December 28, 1945, to H.R. 4805, President Truman completed action making available the additional funds for federal agencies provided in the First Deficiency Appropriation Bill for the current fiscal year ending June 30. As noted in *Railway Age* of December 22, 1945, page 1033, this measure included \$443,000 for the Interstate Commerce Commission, \$23,900 for the National Mediation Board, and \$25,516,000 for rivers and harbors work.

I. C. C. Extends Motor Carriers' "Emergency" Status

Authority previously granted by the Interstate Commerce Commission to various motor carriers to suspend operations until December 31, 1945, on account of conditions arising out of the war, has been further extended in various instances to June 30, 1946, and appropriate tariff publication has been approved. Likewise, numerous motor carriers of property and passengers that have been operating under temporary authority granted during the war period have been advised that such temporary authority has been extended, and appropriate tariff publication has been approved in such

cases also, it being the commission's view, as indicated in orders by Commissioner Aitchison, that the "existing emergency will continue to exist after December 31, 1945."

Emergency Order M-6 of the commission, authorizing the employment of one common carrier trucker by another for the transportation of household goods, which was set to expire December 31, 1945, has been continued in force to June 30, 1946, by Division 3.

Club Meetings

The Central Railway Club of Buffalo (N. Y.) will hold its 57th annual installation of officers and dinner at 7 p.m., January 10, in the ballroom of the Hotel Statler. W. J. Sheridan, assistant general freight agent of the Baltimore & Ohio, will be honored as retiring president.

The Southern and Southwestern Railway Club will meet at 10 a. m., January 17, at the Ansley hotel, Atlanta, Ga. A paper on communications will be presented by L. J. Prendergast, superintendent of communications, Baltimore & Ohio.

F. Gaffney, transport economist, of the department of development and research, Canadian National, will address the 8 p. m., January 14, meeting of the Canadian Railway Club, to be held in the Mount Royal Hotel, Montreal. His topic will be "Order or Chaos in Transportation."

Adjustment Board Decisions

The First Division of the National Railroad Adjustment Board has handed down decisions in 12 cases, involving 6 railways. Abstracts of these cases follow:

Alton Railroad vs. O. R. C. Award No. 10617, Docket No. 20043. No referee. Employees used to handle troop and deadhead passenger equipment trains between Mexico-Francis, Mo., and Kansas City, and light engine and caboose between Slater, Mo., the home terminal (between Mexico and Kansas City), and Mexico-Francis claimed freight rates of pay instead of passenger because caboose was supplied for use of train crew. The company contended that the use of a caboose was irrelevant and was solely for the convenience of the crew and that the type of service was the controlling factor in determining the applicable basis of pay, since both contestants were agreed that had a passenger car been used passenger rates should have been paid. The adjustment board sustained the claim of the employees.

Atlanta, Birmingham & Coast vs. B. of L. F. & E., Sidney St. F. Thaxter, Referee. In (two cases) *Award No. 10614, Docket No. 15826*, the employees involved were enginemen and firemen on first class trains, handling both freight and passenger equipment between Manchester, Ga., and Elyton (Birmingham, Ala.) and yard enginemen and firemen at Manchester. The employees claimed an extra day's pay at yard rates for the engine crews of the trains involved, plus a day's pay at yard rates for the senior extra engine crew at Manchester not working, as a result of the road crews' being required to pick up freight equipment off two to four tracks at Manchester, the initial terminal, or to place arriving freight cars in their train on a designated yard track at that point. Freight rates of compensation were paid when freight cars were handled, passenger rates being applied when the trains consisted

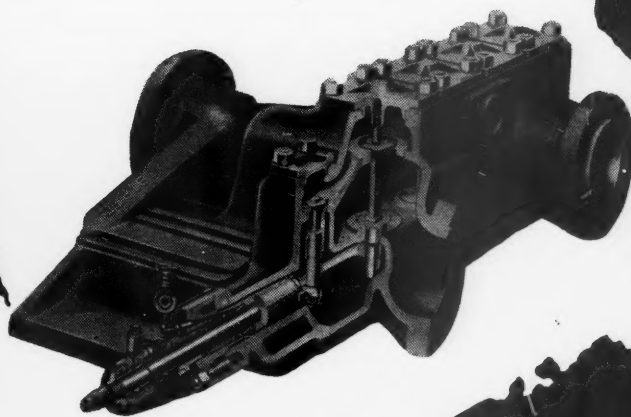
solely of passenger equipment. Existing contracts provided that, in road freight service, road crews could be required to assemble their own trains during hours yard crews were not assigned to work, and could be required to "double over" at any time. The claim was denied.

In Award No. 10615, Docket No. 15827, an extra day's pay as hostler was claimed because fireman was held at Elyton twenty-four hours to protect a job as hostler. In this case, the extra board was located at Manchester, and an extra fireman was sent to Elyton to protect a vacancy from 6:00 a.m. to 2:00 p.m., July 23, and actually did work that job. On that same date the hostler going on duty at 2:00 p.m. bid and was assigned to the 6:00 a.m. position, leaving the 2:00 p.m. job vacant, effective July 24. In order to protect the new vacancy the extra fireman was held at Elyton from 2:00 p.m., July 23, until 2:00 p.m., July 24, when he went on duty, working the job on that and several subsequent days. The contract between the employees and the carrier provides that "engineers and firemen in pool freight and in unassigned service held at other than home terminal will be paid continuous time for all time so held after the expiration of 16 hr. from time relieved from previous duty." It was the contention of the employees that since vacancies in the position of hostler were required to be filled from the ranks of firemen, that the "held away from home" provisions of the contract applied to firemen working as hostlers, while the railroad maintained that only men actually working as engineers or firemen were covered by the rule. The referee found that since, during the time he was performing hostler's duties at Elyton, the employee maintained his status as a fireman, the "held away from home" rule was applicable and the claim was sustained.

Boston & Maine vs. B. of R. T., Award No. 10606, Docket No. 20090. In this case the union claimed a day's pay as a yard foreman at time and one-half rates, for each of several days on which a yardman, who was unqualified as a foreman, was used as a yard foreman rather than "doubling" a qualified yard foreman eight hours in addition to his regular assignment. Had the yard foreman been doubled it would have been necessary to relieve him prior to the expiration of 16 hr. in order to make him available to protect his regular assignment. Further, had he been so used, he would have been required to be on duty near 16 hr., on as many as seven consecutive days, a practice which the carrier did not consider safe. As arranged by the carrier, no employee was required to work more than 8 hr. in any 24-hr. period. The board found that the work in question should have been given a qualified yard foreman so long as there was one who was willing to "double" and the claim was sustained.

Central Railroad of New Jersey vs. B. of R. T., Award No. 10604, Docket No. 16378. In this case the union claimed pay at local freight rates in lieu of passenger rates because certain shipments of company material were handled in the baggage car of a regular passenger train, the material consisting of shovels, acid hampers and cartons and boxes, the contents of which were not specified. The claim was sustained.

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Chicago, Burlington & Quincy vs. B. of L. F. & E., Award No. 10646, Docket No. 10121, Sidney St. F. Thaxter, Referee. An employee requested the difference in pay that a fireman would have received had he been used on his regular assignment, rather than being held for and used as an engineer. It was the employee's contention that, notwithstanding the fact that the carrier knew that an extra engineer would be needed at noon, the fireman who was the only qualified engineer available, should have been permitted to fulfill his regular assignment starting at 10:30 a.m., leaving no one to protect the train which was to be operated at noon. In the opinion of the referee the carrier was justified in holding the fireman for emergency service as an engineer and the claim was denied.

C. B. & Q. vs. B. of L. E., B. of L. F. & E., O. R. C. and B. of R. T., Sidney St. F. Thaxter, Referee, Award No. 10645, Docket No. 19350. This case arose as a result of a claim for a minimum day's compensation (100 miles) for a round-trip of 28 miles from the initial terminal to a point on a short stub line, thence through the initial terminal to the final destination. Similar service was not operated in the opposite direction. Following abandonment of 14 mi. of line, Nelson, Neb., was left at the end of a 14 mi. spur, breaking out of the branch line extending between DeWitt, Neb., and Holdredge at Edgar. In establishing local, mixed train service over the remainder of the line, Edgar was made the away-from-home terminal and runs were advertised from Wymore, Neb. (a point beyond DeWitt), to Edgar. The train left Wymore, the home terminal, on Monday, Wednesday and Friday, returning to Wymore via Nelson, thence back to Edgar, thence to DeWitt and Wymore, on Tuesday, Thursday and Saturday. Referee Thaxter found that this was an improper assignment and that the claim was valid, except that it should be denied for those trips made prior to the date on which the employees protested the assignment.

In *Award No. 10644, Docket No. 19349, Sidney St. F. Thaxter, Referee*, the same groups were parties to a dispute in which the employees claimed payment for a minimum day in addition to their trip from Galesburg, Ill., to Ottumwa, Ia., on May 5, 1941, and unlisted subsequent trips by numerous crews, because of being required to deliver cars on three separate tracks in the yard of the Iowa Ordnance Plant, according to the nature of the lading. This concern performed its own switching. While the evidence is not clear on the point, it appears that the C. B. & Q. crews were not required to switch out the cars, they being already blocked in the train, but rather were required only to make the delivery on three separate tracks, as requested by the consignee. Referee Thaxter found that deliveries of this type to the Ordnance plant, in spite of its size and in spite of the fact that it operated its own switch engines, did not come within the same category as performing switching service in the yard of another railroad, as claimed by the employees, and therefore denied the claim.

Southern Pacific vs. B. of L. E., Award No. 10649, Docket No. 19382, Sidney St. F. Thaxter, Referee. In this case the referee refused to set aside the discipline as-

sessed by the management stating: "In a case of discipline this division interferes to set aside or to modify a decision only when the procedure adopted by the carrier has denied to an employee a fundamental right or when the decision imposing the discipline is manifestly unjust. The mere fact that the official presenting the complaint determines the question of guilt and imposes the penalty, though not an ideal practice, does not, without more, invalidate the proceedings. In this instance the hearing seems to have been impartially conducted."

In *Southern Pacific vs. B. of L. F. & E., Award No. 10568, Docket No. 20053*, the first division held that the claim for an additional day's pay at passenger rates for service over two seniority districts, where train numbers changed at the point where the seniority districts changed, be denied on the grounds that the duties were clearly defined in the assignment, which was made according to contract provisions permitting such inter-divisional assignments, subject to a mileage equalization.

Decisions were also given in two disputes between the Texas & Pacific and the O. R. C., no referee being required in either case. In *Award No. 10618, Docket No. 20117*, a conductor claimed pay for 100 miles plus 5 hr. 35 min. overtime in lieu of 100 mi. allowed for a trip from Marshall, Tex., to Texarkana on account of having been tied up at Marshall, an intermediate point on the division, the previous night after two days on a work train. It was the contention of the organization, which was upheld by the board, that pay should have been continuous from the expiration of the legal rest period of 8 hr. It was apparently the belief of the board that because the message of the chief dispatcher read "Tie up at Marshall for rest . . ." the crew remained in work service until the following morning and was tied up under the hours of service law although the actual time on duty, 12 hr., was 4 hr. less than the maximum permissible under the law and 2 hr. less than the minimum provided for in the contract.

In *Award No. 10619, Docket No. 20118*, two claims for 50 mi. pay as penalty for "run arounds" were asked. In one instance the first division held that where an extra conductor was called to fill a job before the expiration of the rest period of a regular conductor and the latter, in turn, was required to go on duty after the extra man had left but before the expiration of his own rest period, the regular conductor was entitled to payment for a "run around." In the second case the board held that where an emergency conductor was called to dead-head to a distant point to protect an extra passenger train, when, by making use of his dead-head travel time as a portion of his legal rest period, the regularly assigned extra passenger conductor could have protected the job without delay to the train, the extra passenger conductor was entitled to payment for a "run around."

A list of current books and other publications on transportation subjects will be found on page 132.

Equipment and Supplies

FREIGHT CARS

The DELAWARE & HUDSON has ordered 25 40½-ft. 50-ton steel sheathed box cars from the American Car & Foundry Co.

THE ELGIN, JOLIET & EASTERN has placed an order with the American Car & Foundry Co. for 300 50-ton, mill-type, drop-end gondola cars and 200 50-ton steel underframe flat cars.

PASSENGER CARS

Pennsylvania Asks Bids for 214 New Passenger Cars

On December 27 the Pennsylvania announced that it has requested bids from the car builders for the construction of 214 light-weight streamlined passenger cars, including sleeping cars, diners, lounge and observation cars and coaches. The new cars, all of the most modern design, resulting from extensive research and study, will be used to re-equip seven of the road's fleet of "Blue Ribbon" trains, including the "Broadway Limited," "Liberty Limited," "The General," "Spirit of St. Louis," "Cincinnati Limited," "The Pittsburgher," and "The Golden Triangle." It is estimated that the orders when placed will total approximately \$21,000,000.

Including 112 new coaches already announced, and now being built, the new purchases will bring the Pennsylvania's total of cars on order to 326. The 112 coaches now under construction are to be used to re-equip "The Trail Blazer" and "The Jeffersonian," and to augment New York-Florida service in joint operation with other railroads.

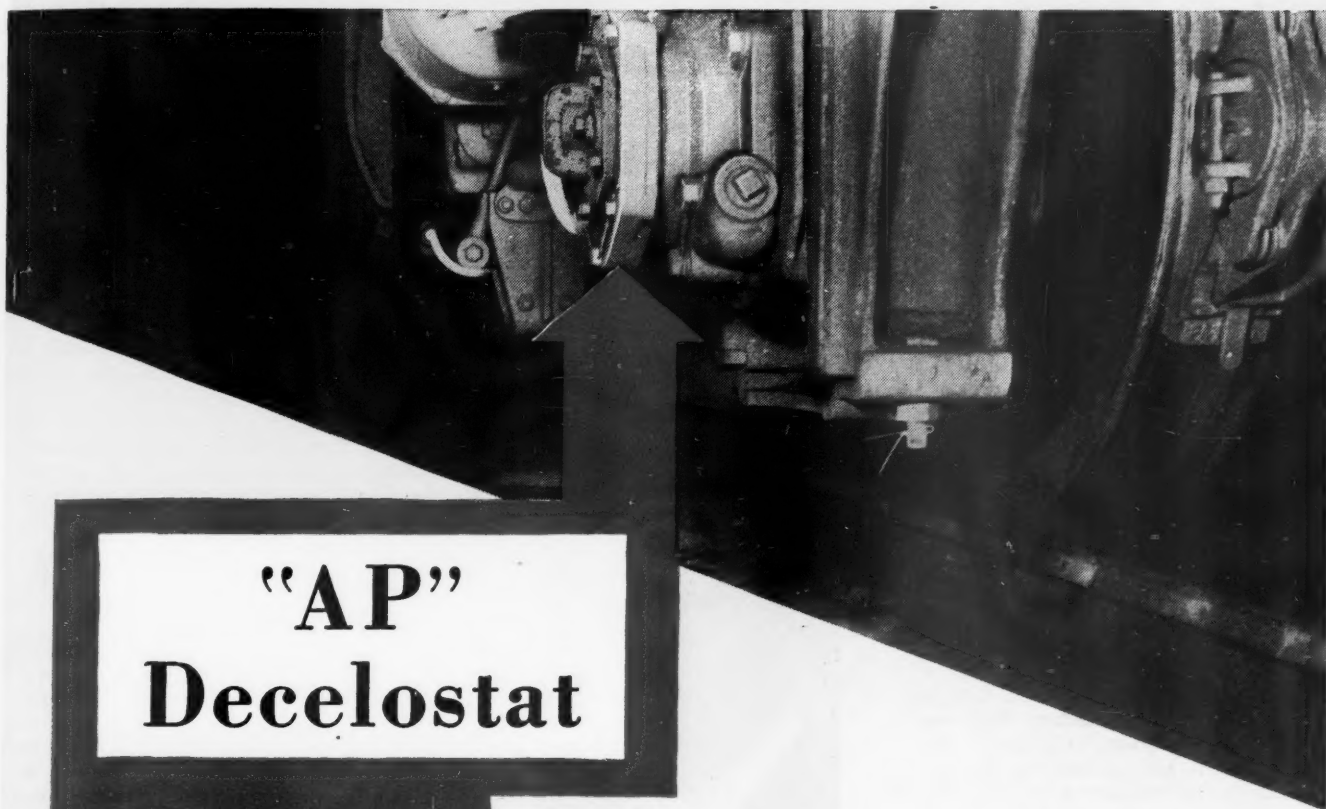
The new inquiry for 214 cars comprises 129 all-room sleeping cars, 21 lounge cars, nine observation-lounge cars, 11 twin-unit dining cars (22 cars), six single dining cars, 21 coaches, two coach-lounge cars and four baggage-dormitory cars. Bids are to be submitted by January 10.

SIGNALING

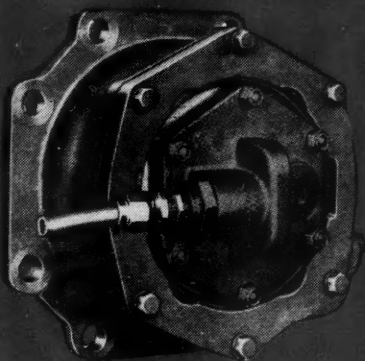
THE CANADIAN PACIFIC has placed an order with the Union Switch & Signal Co. covering the signal material for the installation of absolute permissive block signaling on the Chalk River Sub-division in the 114-mile single track territory between Smith Falls, Ont., and Chalk River. The order includes Style H-2 searchlight signals, Style U-5 switch circuit controllers, DN-11 relays, switch indicators, rectifiers and housings. The field installation work will be carried out by the railway company's signal forces.

THE RICHMOND, FREDERICKSBURG & POTOMAC has recently completed an installation of electro-pneumatic power switch machines and car retarders in the southbound classification yard at Alexandria, Va. The equipment furnished by the Union Switch & Signal Co. included 7 Model 31 retarders, involving 800 rail feet of retardation, 28

Sentry on Wheels



"AP" Decelostat



**Softens the Brake
When Wheel Slip Impends**

THE Decelostat is a sentry that is always at its post—on the wheel—ever on the lookout for irregularity in wheel-rail adhesion.

When brakes are applied it measures rate of retardation. If slippery rail is encountered the Decelostat won't let the wheel slip into a slide. It eases up on the brake, promptly—before the slide can develop. This is done in less than a second.

Braking pressure is softened—but only for the moment, and only on the affected wheels. Then the braking pressure is restored to the existing train level.

Westinghouse Air Brake Company

Wilmerding, Pa.

direct-acting electro-pneumatic switch layouts, with relays and housings for detector track circuits for the 28 switches and 29 power skates. All of the functions are operated from 3 control machines located in 3 towers within the yard limits. With the completion of this installation, Potomac Yard is now completely mechanized, as the northbound yard had previously been equipped with electro-pneumatic retarders.

The SEABOARD AIR LINE has placed an order with the Union Switch & Signal Co., for signal materials for a number of remote control locations between Raleigh, N. C., and Hamlet, approximately half of which will be controlled by carrier equipment with telephone communication on the code line. A 10-ft. Style C control machine is to be located at Raleigh with other machines controlling the territory from Richmond, Va., to Raleigh. In addition to the control machine and code equipment, the materials involve Style M-22A low-voltage dual-control electric switch movements, Style R-2 color-light signals, relays, rectifiers and housings. The field work will be done by the construction forces of the railway.

Supply Trade

Clinton E. Frank, formerly assistant account executive of Blackett-Sample-Hummert, Inc., an advertising firm of Chicago, has been appointed assistant to the president of the **Standard Railway Equipment Company**, Chicago. Mr. Frank received his higher education at Yale University, graduating in 1938, and in the same year he joined Blackett-Sample-Hummert. He held several positions with that organization until he was promoted to assistant account executive. In March, 1941, Mr. Frank became a second lieutenant in the Army where he served until September, 1945, when he was discharged with the rank of lieutenant-colonel. Dur-



Clinton E. Frank

ing his term with the armed forces he served in the European and Mediterranean theaters of operation as aide to Lt. Gen. James H. Doolittle and later as executive officer of a heavy bombardment group. Upon his return to the United States in 1944 Mr. Frank was assigned as director of civilian personnel with the 2nd Air

force, with headquarters at Colorado Springs, Colo., and later as director of both military and civilian personnel.

Sidney G. Down, first vice-president and director of the **Westinghouse Air Brake Company**, Wilmerding, Pa., retired December 31, after 44 years of service with the company. He retained his directorship in the company. Mr. Down began his career in the locomotive department of the Michigan Central at Detroit, Mich., and subsequently was assigned to the position of air brake instructor and inspector. In 1897 he organized an expedition to the Klondike gold fields and spent three years in that territory. He rejoined the Michigan Central upon his return to Detroit in 1900. Two years later he was employed by the Westinghouse Air Brake Company as an air brake instructor, in charge of the instruction car, and traveled throughout the country teaching railroad employees the principles of construction and operation of air brakes. He was appointed a mechanical expert in the com-



Sidney G. Down

pany's Chicago headquarters of the western division in 1905 and was transferred to San Francisco, Cal., as chief engineer of the Pacific Coast district in 1910. He was largely responsible for the establishment of the Westinghouse Pacific Coast Brake Company at Emeryville, Cal., of which he later became president. He also was general manager of the Pacific Coast division of the Westinghouse Air Brake Company. He returned to Wilmerding as general sales manager of the Westinghouse Air Brake Company in 1921. He spent considerable time in the Orient, Europe, and South America, studying foreign railway operation and the development of foreign markets for railway appliances. He was elected vice-president of the Westinghouse Air Brake Company in 1923, a director in 1925, and was promoted to first vice-president in 1937.

Mr. Down also is president and a director of the American Brake Company; a director and member of the executive committee of the Bendix Aviation Corporation; a director and executive vice president of the Bendix-Westinghouse Automotive Air Brake Company; a director and first vice president of the National Brake & Electric Co.; president and a director of the Westinghouse Friction Draft Gear Company; and a director of

the Canadian Westinghouse Company, the Union Switch & Signal Co. and the First National Bank of Wilmerding. For seven years he was president of the Railway Supply Manufacturers' Association and, during the war, he served on the War Production Board's railway advisory committee.

J. B. Akers, Jr., southeastern representative for the Buda Company, has been appointed sales and service engineer for **Ralph W. Payne**, railway equipment, Washington, D. C.

George D. Creelman, administrative assistant at the Institute of Gas Technology, Chicago, has been appointed director of a new department established by the **M. A. Hanna Company** to conduct technological research in coal and other industrial lines in which the company is interested.

Frank R. Meyer, Jr., vice-president in charge of tin plate and export sales, **L. S. Marsh**, formerly manager of the department of inspection and metallurgy in the Chicago Office, and **J. de N. Macomb**, manager of sales engineering, railroad sales division of the Inland Steel Company, retired on January 1.

In a series of administrative changes announced on December 27 by the board of directors of the **American Locomotive Company**, **Duncan W. Fraser**, president, was elected chairman of the board to succeed **William C. Dickerman**, who has resigned. Mr. Dickerman will continue as a director and a member of the executive committee and also will remain in a consultative capacity. **Robert B. McColl**, executive vice-president, was elected president. Additional details of the changes will be published in the *Railway Age* of January 12.

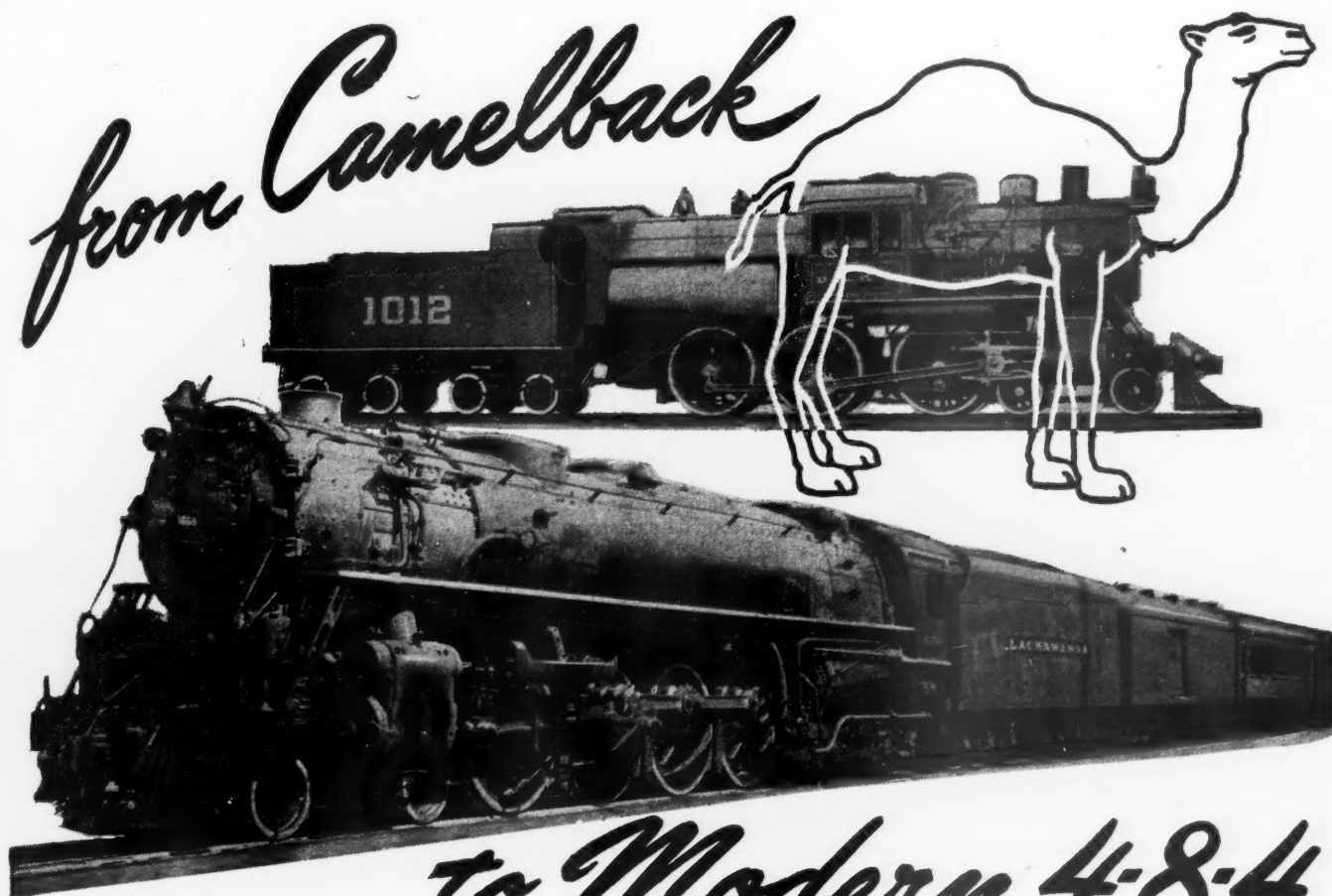
A. W. Faulconbridge has been appointed in charge of the railroad division of the **Haskelite Manufacturing Corporation** of Grand Rapids, Mich. Mr. Faulconbridge advanced through the ranks with the Canadian Pacific and the Canad-



A. W. Faulconbridge

ian National. During the war years, he was production manager of Canadair, Ltd., in Montreal, the largest producer of military aircraft in the Dominion, which position he left to join the Haskelite Manufacturing Corporation.

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for Cylinders and Valves
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Sectional Packing)
Cylinder Snap Rings
Valve Rings, All Shapes

Financial

BALTIMORE & OHIO.—Promissory Notes.—This company has applied to the Interstate Commerce Commission for authority to issue \$1,200,000 of series J promissory notes in connection with its purchase from the Ralston Steel Car Company of 500 50-ton hopper cars at a cost of \$2,778 each.

CHESAPEAKE & OHIO-NEW YORK CENTRAL.—Lease Extension.—Division 4 of the Interstate Commerce Commission has approved an extension of these roads' lease of the Nicholas, Fayette & Greenbrier to include a new 4.76-mile branch built to reach an undeveloped coal mining area. The division also authorized the Alleghany Corporation to exercise control of the extension through its control of the C. & O. Alleghany had asked for a dismissal of its application to exercise control on the ground that the commission's general approval of its control of the C. & O. was sufficient, but the division held that the Supreme Court decision in the so-called *Marshall Transport* case necessarily made Alleghany a party to the extension of control.

LOUISIANA MIDLAND.—Acquisition.—Division 4 of the Interstate Commerce Commission has authorized this new company to purchase the following facilities from the Louisiana & Arkansas: (1) its line from Packton, La., to Wildsville Junction, 53.32 miles; (2) its rights to operate over a Missouri Pacific line from Wildsville Junction to Vidalia, 23.02 miles; and (3) its rights to use the Mississippi river ferry from Vidalia to Natchez, Miss. For these facilities and certain equipment, the new company will pay \$200,000 cash. This amount, together with working capital, will be obtained by the sale at par of 2,500 shares of capital stock of \$100 par value to H. H. Holloway, whose control of the new company has been approved by Division 4. He also controls the West Feliciana, but there is no physical connection between the two roads. The L. & A. has agreed to protect all employees who may be affected by the transaction as provided by the so-called Washington agreement, and the division, in authorizing the acquisition, has reserved jurisdiction for four years with respect to prescribing protective conditions, if any should be required, for employees who are not represented by the Railway Labor Executives Association.

MAINE CENTRAL.—Bond Redemption.—On December 31, the Maine Central issued a call for redemption of \$1,585,000 of its first series 6 per cent bonds, issued in 1934 and due January 1, 1959. The bonds will be paid at the First Portland National Bank, Portland, Ore. The call price was \$102 and accrued interest to February 1, 1946.

NEW YORK CENTRAL.—Equipment Trust Certificates.—Division 4 of the Interstate Commerce Commission has authorized this company to assume liability for \$17,700,000 of 1½ per cent equipment trust certificates in connection with its purchase of the equipment listed below, the aggregate cost of which is estimated at \$22,308,500. The certificates have been sold at 99.517 to Halsey,

Stuart & Co. and others, making the average annual cost of the proceeds to the company about 1.59 per cent. While the company has substantial cash and liquid assets available, it prefers to continue with its program for the reduction of outstanding indebtedness carrying higher interest rates, the division pointed out in its report. During the period 1933-1944 inclusive, its annual interest charges have been reduced by 28.7 per cent, and in the latter year alone capital obligations were reduced \$33,786,774. A further reduction of \$8,918,061 in 1945 was anticipated.

The equipment to be purchased with the proceeds of this transaction includes: Two 1,350-hp. "A" unit Diesel-electric freight locomotives at \$134,000 each; 750 70-ton covered hopper cars at \$4,040 each; 153 64-passenger coaches at \$68,500 each; 60 56-passenger stainless steel coaches at \$73,500 each; four 64-passenger full-length stainless steel dining cars at \$88,000 each; four 21-passenger stainless steel kitchen-lounge cars at \$93,000 each; four 53-passenger stainless steel tavern-lounge-observation cars at \$99,000 each; 20 48-passenger aluminum combination passenger-baggage cars at \$65,000 each; and 50 baggage cars at \$34,000 each.

Dividends Declared

Reading.—25¢ quarterly, payable February 14, to holders of record January 17.

Railway Officers

EXECUTIVE

W. Manson has been appointed vice-president personnel of the Canadian Pacific at Montreal, Que.

E. F. Barnes has been appointed assistant to the chief executive officer of the Missouri Pacific, with headquarters at St. Louis, Mo.

C. L. Persons, assistant to the executive vice-president of the Chicago, Burlington & Quincy at Chicago, has retired after 40 years of service.

G. W. Imgrund, whose election to vice-president of the Chicago & Illinois Midland, with headquarters at Springfield, Ill., was reported in the *Railway Age* of December 22, was born on February 18, 1883, at Springfield, Ill., and entered railway service in 1897 as a machinist apprentice on the Wabash. Four years later, when he completed his apprenticeship on the Wabash, he became a machinist for a manufacturer at Springfield, re-entering railway service in 1902 as a machinist on the Baltimore & Ohio, at Newark, Ohio. From December, 1902, until February, 1927, he served successively as roundhouse foreman on the Baltimore & Ohio at Lorraine, Ohio, and New Castle, Pa., as mechanical inspector on the Lake Shore & Michigan Southern (now a part of the New York Central), as a machinist on the Wabash, as erecting foreman at Springfield, and a roundhouse foreman at Chicago and De-

catur, Ill., as general foreman of the locomotive and car departments and as master mechanic of the Chicago, Peoria & St. Louis at Jacksonville, Ill. On February 1, 1927, Mr. Imgrund was appointed master mechanic of the Chicago & Illinois Midland, and served in that capacity until November, 1930, when he was promoted to superintendent of motive power and equipment. On January 1, 1932, he was further advanced to superintendent of the transportation, car, and locomotive departments, which position he retained until June, 1940, when he was promoted to general superintendent, the position he held at the time of his recent election to the vice-presidency of the same road.

W. C. Hurst, whose retirement as president of the Chicago & Illinois Midland, with headquarters at Springfield, Ill., was reported in the *Railway Age* of December 15, was born at Durham, England, on June 27, 1877, and entered railway service in April 1890, as a water boy on the Chicago, Burlington & Quincy in Missouri. He later served successively as a track laborer, yard clerk, rodman, assistant engineer, resident engineer on construction



W. C. Hurst

and engineer of construction. In July, 1903, he went with the Missouri Pacific as assistant superintendent at Chester, Ill. Two years later he went with the Ann Arbor and Detroit, Toledo & Ironton, assigned to special work in the general manager's office and four months later he was appointed superintendent at Springfield, Ohio. Mr. Hurst later served as a trainmaster and chief clerk to the president and general manager of the Pere Marquette, superintendent on the Cincinnati, Hamilton & Dayton (now part of the Baltimore & Ohio) at Dayton, Ohio, general superintendent of the Chicago, Peoria & St. Louis, and general superintendent of the Eastern district of the Pere Marquette, with headquarters at Saginaw, Mich. On January 1, 1914, he was appointed vice-president and general manager of the Chicago, Peoria & St. Louis, with headquarters at Springfield, Ill. During the period of federal control, Mr. Hurst served as general superintendent of the C. P. & St. L. and of the Chicago & Alton (now the Alton), and on February 1, 1920, he was appointed general manager for the receivers of the C. P. & St. L., later being appointed vice-

president and general manager for the receivers. In 1926, the C. P. & St. L. was split up under reorganization, the northern half being assigned to the Springfield, Havana & Peoria, which, in turn, was leased to the Chicago & Illinois Midland, and Mr. Hurst was appointed senior vice-president of the C. & I. M. In 1940 he was elected to the presidency of the road, the position he held at the time of his retirement.

John B. Large, assistant vice-president in charge of traffic of the Pennsylvania, has retired after more than 43 years of service. Mr. Large was born in Philadelphia, Pa., and attended the University of Pennsylvania. He entered railroading in a clerical capacity for the Pennsylvania at Germantown Junction, Pa. After various promotions, he became division freight agent at Erie, Pa., in 1912, and at Buffalo, N. Y., in 1916. The following year he became general freight agent of the Pennsylvania's lines east of Pittsburgh, with headquarters at Philadelphia, and in 1920 was appointed freight traffic manager for the system, subsequently serving as general traffic manager at Philadelphia. Mr. Large was advanced to assistant vice-president in charge of traffic on May 16, 1943.

FINANCIAL, LEGAL AND ACCOUNTING

Edward F. Flynn, assistant to the vice-president and general counsel of the Great Northern, with headquarters at St. Paul, Minn., has retired.

Wilbur K. Bush, whose promotion to general tax agent of the Chicago, Burlington & Quincy at Chicago, was reported in the *Railway Age* of December 22, was born at Chicago on May 30, 1911, and received his higher education at Northwestern University. He entered railroad service on December 23, 1940, as a tax economist with the Burlington at Chicago, and served in this capacity until he entered the service of the armed forces in 1942. In December he was discharged from the Army, returned to the Burlington, and was promoted to the position he now holds.

OPERATING

W. E. Haist, superintendent of transportation of the Chicago, Burlington & Quincy, has retired after 42 years of service.

W. H. Berghegger, assistant superintendent of dining and parlor cars of the Alton at Chicago, has been promoted to superintendent of dining and parlor cars, with the same headquarters, succeeding **W. R. Morten**, who has resigned.

W. W. Simpson, superintendent of the Birmingham division of the Southern at Birmingham, Ala., has been promoted to general superintendent, with headquarters at Cincinnati, Ohio. He is succeeded by **Colonel F. W. Okie**, who has just been discharged from the armed forces and returns to the position he held prior to his military service.

A. P. Stevens, district manager at New York for the Car Service Division, Association of American Railroads, has re-

tired, effective January 1, after over 59 years' continuous railway service—28 years of it with the Car Service Division and its predecessor organizations. **G. C. Randall**, manager port traffic at New York for the Car Service Division, has assumed Mr. Stevens' duties in addition to those of his present position.

H. C. Batchelder, whose retirement as superintendent of the Toledo division of the Baltimore & Ohio at Dayton, Ohio, was reported in the *Railway Age* of December 15, was born at Cleveland, Ohio, on July 29, 1882. His entire railroad career has been with the Baltimore & Ohio, whose service he entered at Cleveland in 1897 as a caller. After serving in various minor positions until 1917, he became terminal trainmaster at Akron, Ohio, subsequently serving in the same capacity at Cleveland. In 1918 he became trainmaster at Cleveland and later, at Newark, Ohio. From April, 1923, to April, 1931, he served as assistant superintendent successively at Willard, Ohio, Dayton, Washington, D. C., and Cincinnati. In April, 1931, Mr. Batchelder was promoted to superintendent of the Cincinnati Terminal division. And on June 1, 1935, he was transferred to the Toledo division, with headquarters at Dayton, where he remained until his retirement.

Frank I. Umhau, assistant superintendent, car service department, of the Southern at Atlanta, Ga., has been appointed superintendent car service there, succeeding **Robert L. Sproul**, who has retired after 54 years' service. **John W. Allison**, chief clerk of reclaims, has been promoted to assistant superintendent, succeeding Mr. Umhau.

Mr. Sproul was born at Elizabeth, Pa., on March 17, 1876. He attended National Normal University and George Washington University. He entered railroading in 1891 with the Atchison, Topeka & Santa Fe at Topeka, Kan., and subsequently served with the Hocking Valley (now Chesapeake & Ohio) at Columbus, Ohio; the Illinois Central at Chicago, Ill.; and the Delaware, Lackawanna & Western at Scranton, Pa. Mr. Sproul joined the Southern in June, 1902, as distribution clerk at Washington, D. C., where he was advanced to car accountant assistant superintendent of car records. In October, 1938, he was appointed superintendent of car service at Atlanta.

TRAFFIC

A. P. Gorman, freight agent of the Illinois Central at Evansville, Ind., has been promoted to general agent, with the same headquarters.

A. P. Bindrup, commercial agent of the Alton & Southern at Chicago, has been promoted to general agent, with headquarters at Detroit, Mich., a newly-created position.

Lt. L. Duncan Stokes has returned to the Southern after more than three years' service with the Coast Guard. Chief clerk to the district freight and passenger agent at Nashville, Tenn., when he enlisted, he returns to railway service as commercial agent at New York. **Lt. William E.**

Shine, Jr., also with more than three years' duty with the Coast Guard to his credit, has become division freight and passenger agent for the Southern at Selma, Ala. Prior to enlistment he was a freight traffic representative at Chattanooga, Tenn.

A. C. Stenberg, assistant traffic manager of the Duluth, South Shore & Atlantic and the Mineral Range at Marquette, Mich., has been promoted to traffic manager, with the same headquarters, succeeding **R. O. Hambly**, who has retired after 41 years of service.

W. E. Shine, Jr., freight traffic representative of the Southern at Chattanooga, Tenn., who has been on leave of absence to serve in the armed forces, has been promoted to division freight and passenger agent, with headquarters at Selma, Ala., a newly-created position.

The Southern will establish an office of general industrial agent at Charlotte, N. C., on January 1. **F. Clifton Toal**, recently discharged captain in the United States Navy, will head the agency. Mr. Toal was born at Kosciusko, Miss., on March



F. Clinton Toal

12, 1906, and was graduated from George Washington University. He entered railroading with the Southern in 1922 at Columbia, S. C., and held various clerical and secretarial positions there and at Greensboro, N. C., and Washington, D. C., until 1930, when he was sent to the Chesapeake Steamship Company as traffic representative at Winston-Salem, N. C. In 1936, he was appointed merchandising agent for the Southern at Atlanta, Ga., and in 1937 promoted to freight traffic representative there, then, in the same year, commercial agent. Mr. Toal was advanced to general agent at Cleveland, Ohio, in 1939, and to assistant general freight agent at Atlanta, Ga., in 1940, maintaining the latter post until he entered the Navy in 1941.

H. A. Peterson, whose promotion to assistant freight traffic manager of the Northern Pacific, with headquarters at St. Paul, Minn., was reported in the *Railway Age* of December 22, was born at Eau Claire, Wis., on May 20, 1901, and received his higher education at the University of Cincinnati. He entered railroad

service on February 15, 1927, as a city freight agent with the Northern Pacific at Cincinnati, Ohio, becoming traveling freight agent in July of the same year. From September 1, 1929, to June 1, 1934, he served as city freight agent at Chicago, and from the latter date to August 12, 1936, as commercial agent with the same head-



H. A. Peterson

quarters. On August 12, 1936, Mr. Peterson was promoted to general agent at Cincinnati, the position he held at the time of his recent promotion.

Clyde C. Cox has been appointed general eastern freight agent of the Southern at New York, succeeding **R. A. Davis**, promoted to New England freight agent at Boston, where he replaces **R. S. Souther**, who has been named assistant general freight agent at Washington, D. C. In this post he replaces **William Jardine**, who has been named general agent, freight department at Philadelphia, succeeding **R. D. Darden**, promoted.

Omer L. Jeter, formerly freight traffic representative of the Southern at Lynchburg, Va., having served with the armed forces since December, 1940, and having attained the rank of colonel, has returned to the railway as assistant general freight agent at Lynchburg, succeeding **A. R. Gould**, who has been promoted to general agent, freight department, at Baltimore, Md., replacing **N. R. Keeling**, who has retired after more than 39 years of service with the Southern. **Hiram C. Pamplin**, also formerly a freight traffic representative at Lynchburg, having been in military service since 1942 and having attained the rank of captain, has returned to the Southern as division freight agent at Greenville, S. C., succeeding **Howard Cook**, promoted to assistant general freight agent at Augusta, Ga., where he replaces **W. R. Belfield**, who has been promoted to a position bearing the same title at Columbia, S. C. Mr. Belfield succeeds **A. S. Eggerton**, who has retired.

Sidney W. Beacham has been appointed assistant general freight agent of the Southern at New Orleans, La. **Gordon I. Russell** has been named commercial agent at Charlotte, N. C., and **William L. Northern** has been assigned to a similar post at Nashville, Tenn. **James H. Kelley** has been appointed commercial agent at Gainesville, Ga., where his jurisdiction will

include freight traffic matters on the line of the Gainesville Midland. **H. Manly Cobb**, division freight agent at Asheville, N. C., has retired after 42 years' service.

SPECIAL

F. A. Piehl, assistant manager of the Western Weighing and Inspection Bureau, at Chicago, has been promoted to manager, with the same headquarters, succeeding **J. H. Howard**, who has retired after 50 years of service.

Paul Standard has been named by the Canadian Pacific as press relations officer of the road's recently reorganized public relations department with headquarters at New York. **Clara L. K. Holmes** has been appointed to head the women's division at Winnipeg, Man.

MECHANICAL

Adam McGregor, whose appointment as mechanical engineer of the car department, the Canadian National, at Montreal, Que., was announced in the *Railway Age* of December 22, is a native of Kilmarnock,



Adam McGregor

Scotland, and was educated at the Royal Technical College at Glasgow. He entered the service of the Canadian National at Winnipeg, Man., in 1921, and successively held the positions of draftsman, mechanical inspector, and locomotive inspector. In 1943, he went to Montreal as mechanical inspector. Mr. McGregor became chief draftsman in October of this year.

ENGINEERING & SIGNALING

F. D. Danford, office engineer of the Texas & Pacific at Dallas, Tex., has been promoted to assistant to the chief engineer, with the same headquarters.

H. J. Seyton, assistant chief engineer of the Great Northern at Seattle, Wash., has been promoted to chief engineer, with headquarters at St. Paul, Minn., succeeding **C. M. Nye**, who has retired after 36 years of service.

Glenn A. Williams, whose appointment as engineer of maintenance of way of the Pennsylvania at Pittsburgh, Pa., was announced in the October 27 issue of *Railway Age*, was born at Altoona, Pa., on May 1, 1904. He began his railway career

in 1927 as an assistant on the engineering corps for the Pennsylvania at Philadelphia. In 1929 he was advanced to supervisor, and in 1939 to division engineer, serving in that capacity on three divisions. Mr. Williams' appointment as engineer of maintenance of way became effective on October 16, 1945.

E. W. Hobbs has been appointed engineering assistant, executive department, of the Missouri Pacific, with headquarters at St. Louis, Mo., succeeding **P. P. Wagner**, whose appointment to assistant chief engineer at St. Louis was reported in the *Railway Age* of December 22.

OBITUARY

A. F. Sommer, vice-president, treasurer, and general manager of the Quanah, Acme & Pacific at Quanah, Tex., died recently in a hospital in that city.

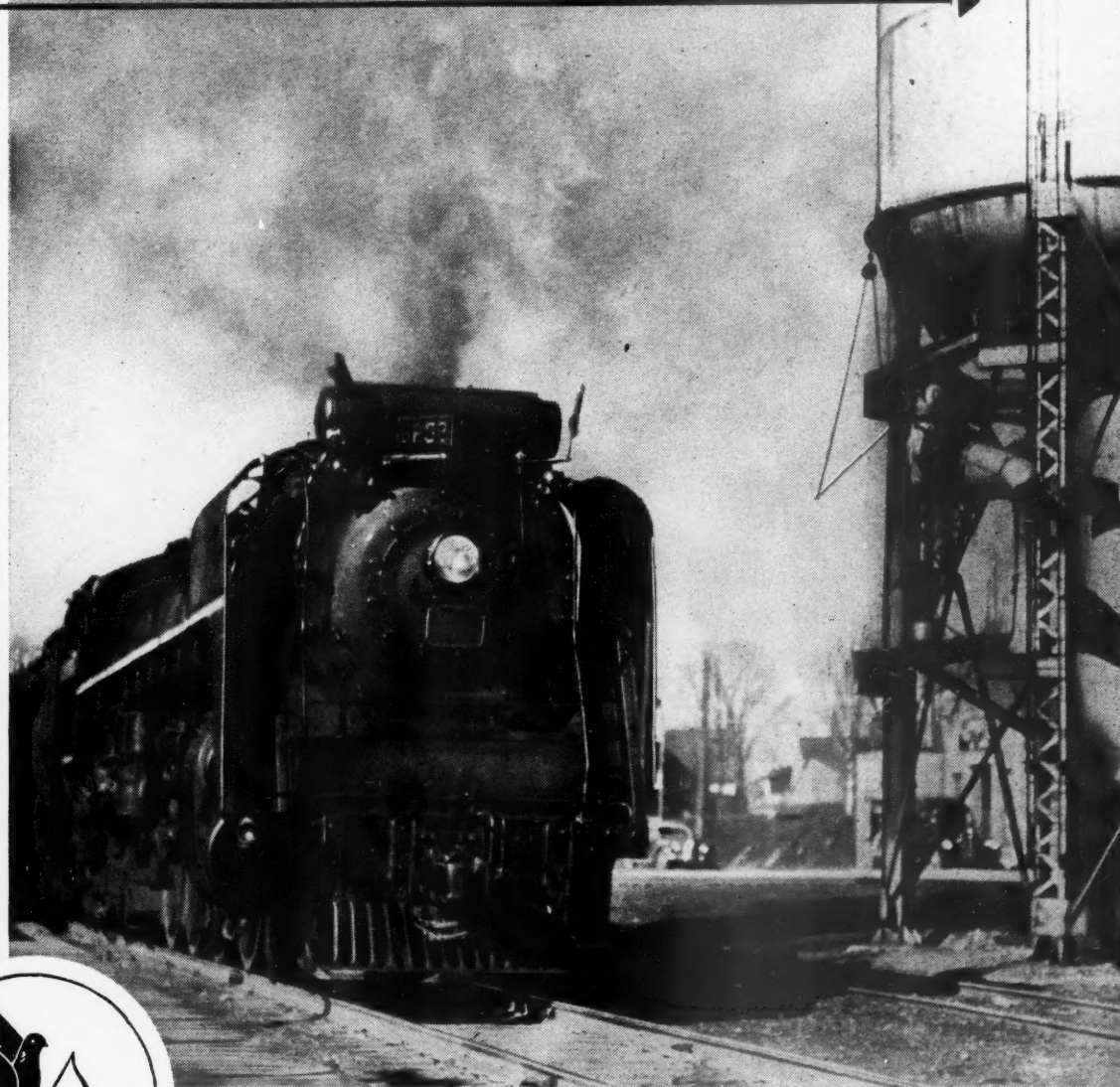
Charles E. Barry, assistant freight traffic manager in charge of import and export traffic for the Chicago, Rock Island & Pacific at Chicago, died at his home in that city on December 26.

Col. Edward J. Langford, retired chief engineer of the New York, Westchester & Boston (now New York, New Haven & Hartford), died on December 19. He was born in Montreal, Que., in 1867, and entered railroading in 1888. He worked in the engineering departments of various railroads on construction in West Virginia, Maryland, and Pennsylvania until 1897. He then went with the Central of Georgia as a draftsman and was subsequently advanced through various positions to principal assistant engineer. In 1909 he went with the New York, Westchester & Boston as principal assistant to the engineer. In 1912, he was advanced to chief engineer. Col. Langford served as an engineer officer in transport work in France during World War I.

MESSAGE FROM THE P. R. R.—In a four-page folder addressed to "our patrons, old and new," the Pennsylvania imparts "something to interest everyone who travels." The traveler is informed of steps the railroad is taking to improve travel over its lines, being advised of orders for "a substantial number of new cars embodying appointments and comforts new in travel," of extra-powerful locomotives, and of dining car service being restored to peace-time standards. The pamphlet is in color and includes the advertisement "Something New on the Table" which the P. R. R. currently is running in a number of national magazines.

BRITISH TRAVELING POST OFFICES.—A further sign of returning peace-time convenience in Great Britain, according to T. D. Slattery, general traffic manager of British railways in New York, is the resumption recently of the traveling post office on the London, Midland & Scottish, between London and Aberdeen, and on the Great Western, between London and Penzance. This postal service, including apparatus for dropping and picking up mail pouches, has been in operation for over a century, and prior to the war more than 72 traveling post offices operated in Great Britain.

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